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The article, "Ornithology" was reprinted in the 8th edition, where it forms the last article of vol. XVI. pp. 725-829 with plates III - XVIII, without, so far as I know, any alteration save a list of ornithological works published since 1842 which was added ~~at~~ the end, and this appeared in 1858.

Alfred Newton
in litt. 9. I. 1902.

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AN
INTRODUCTION
TO THE
NATURAL HISTORY OF BIRDS;

BEING THE ARTICLE "ORNITHOLOGY," FROM THE SEVENTH EDITION

OF THE
ENCYCLOPÆDIA BRITANNICA.

WITH ONE HUNDRED AND THIRTY-FIVE FIGURES.

BY
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AND OF THE ENTOMOLOGICAL SOCIETY OF FRANCE.

ADAM AND CHARLES BLACK, EDINBURGH;
SIMPKIN, MARSHALL, & CO., WHITTAKER & CO., AND HAMILTON, ADAMS, & CO.
LONDON; AND JOHN CUMMING, DUBLIN.

M.DCCC.XXXIX.

ORNITHOLOGY.

History. ORNITHOLOGY, from *ὄρνις*, *bird*, and *λόγος*, *discourse*, is that department of Zoology which treats of the history and attributes of the feathered race. Birds form the second great division of the animal kingdom, being usually placed immediately after the Mammalia, and antecedent to the reptile class. They may be defined as vertebrated, oviparous animals, covered with feathers, organized for flight, and enjoying a double system of circulation and respiration; that is, their whole blood, like that of quadrupeds, must visit the lungs and return to the heart before it is propelled to the extremities,—and the entire system is provided with reservoirs of air, in addition to the lungs properly so called.

The vast extent which the science of Ornithology has acquired in recent times renders a full exposition impossible within our necessarily prescribed limits; but we shall endeavour at least to indicate the majority of the more important groups, to figure and describe in each some interesting species, and by frequent reference to such authors as have most successfully treated of the different branches in detail, enable such of our readers as desire a more elaborate view, to follow out the subject for themselves. We presume it matters not with which department we commence. Let us begin, then, with the Bibliography, which, however, need not detain us long.

Few if any important works have been transmitted to us from antiquity. In the third book of Aristotle's *History of Animals* (*Περὶ Ζῴων Ἱστορία*, the period being about 350 years before the Christian era) we find recorded sundry observations, but brief and superficial, on the feathered race.¹ His division seems to be into such as have hooked claws, such as have separated toes, and such as are web-footed; and he observes, that the first have the breast the most robust. He describes the differences in the structure of the feet, and notices, that although the generality have three toes in front, and one behind, yet a few have only two toes in front. The bill supplies the place of lips and teeth, and passages in different parts of the head supply the place of the external organs of the senses of smell and sound. The eyes are furnished with a membrane like that possessed by lizards, but want eyelashes. No bird with hooked claws has likewise spurs upon its legs. These are a few examples of Aristotle's style of observation on the class in question.

Pliny was born about the twentieth year of the Christian era. The tenth book of his *Historia Naturalis* treats in part of birds, but in a very meagre and immethodical manner. He tells us of the raven and the phoenix, of the owl, the ibis, and the nightingale, of capons, and the cock-fights of Pergamus, and of the character and conduct of various other birds.

For 1500 years from the time of Pliny we have no recorded observations on Ornithology deserving of the reader's recollection. About the middle of the 16th century Conrad Gesner, a native of Zurich, and a noted Frenchman called Pierre Belon, each published works in part devoted to Ornithology. The writings of Gesner (*Historia Animalium*, 3 vols. folio) exhibit a cumbrous erudition, with a sprinkling of original observation, but are chiefly extracted from ancient authors. Baron Cuvier regarded him as an excellent compiler. His arrangement is alphabetical. Belon's most successful efforts were in the ich-

thyological department, but even in his *Historia Avium*, 1 vol. folio, 1551, we may trace an improved spirit of observation, although the basis of his classification would scarcely suffice to support a system now-a-days. He divides the class of birds into six primary divisions. 1st, The birds of prey, among which, misled probably by some false analogy of plumage, he includes the cuckoo. 2d, The Palmipedes. 3d, The Grallæ, including, however, the king-fisher, bee-eater, and other anomalous species. 4th, All the species which place their nests upon the ground,—an extraordinary bond of union, which of course brings together the pheasant, the lark, and the woodcock. Nevertheless, our author does not confound them in his lesser groups. 5th, The omnivorous and insectivorous birds, among which are placed the pigeons. 6th, The insectivorous and granivorous species, which habitually frequent shrubs and hedges.

Another noted writer of the sixteenth century was Ulysses Aldrovandi of Bologna, whose works amount to thirteen volumes folio;—the majority of them, however, were not published till after his death in 1606. The first three, which treat of birds (as well as one on insects), made their appearance in his lifetime, that is, from 1599 to 1603. They contain some amusing information, amid a vast mass of learned rubbish borrowed from his predecessors. Professor Savi, however, characterised the ornithological portion as “un monumento glorioso del suo instancabile zelo, delle sue estese cognizioni ornithologiche, e della sua universale erudizione.” It is at the same time entirely deficient in scientific precision, and contains, amid much truth, a sad intermixture of unmeaning fable. The edition with which we are best acquainted is that of Bologna, 1634.

About nearly the same period a treatise was published by Gommer de Luzaney, with the title of *De l'Autourserie*, which contains some good figures of the birds of prey used in falconry. One of the earliest sketches of the history of European birds is that given by Schwenkfeld, a Prussian naturalist, in a volume entitled *Theorio-Tropeum Silesiæ*, 1603. The arrangement is alphabetical. Olina's *Uccelliera*, which contains tolerable figures of a few species not previously published, appeared at Rome in 1622. It is a small affair, restricted to the description of very few species, but contains accurate and interesting records of their history and mode of capture, as practised by the Italians, with whom *la caccia*, very different from that of Melton Moubay, is a noted passion. A swarthy, fire-eyed hunter of sixty-five is as proud of a string of dead linnets as any young Scotchman of sixteen may be of his first well-filled bag of grouse or black game.

We have next a dissertation on storks, cranes, and swallows, by J. G. Swalbacius (Spire, 1630); a natural history of Nuremberg (Antwerp, 1633); a description of the birds of the West Indies, by De Laet (Leyden, same year); a history of the birds of Brazil, by Marcgraaff (in his *Hist. Rerum Nat. Brasiliæ*, Amsterdam, 1648); and of those of Mexico, by Hernandez (in his *Nova Plant. Animal. et Min. Mexicanorum Hist.* Rome, 1651). A Scotto-Pole of the name of Johnston published about this period (some years elapsing during the completion of the various parts) his *Historia Animalium*, of which the second portion treats of birds. He is a follower, not so much of nature, as of Belon, and other authors of the pre-

¹ As in some of our preceding treatises on Natural History in this work (see, for example, the article MAMMALIA, vol. xiv. p. 74) we have entered at greater length into the general character of the most ancient writers, our present notices are therefore extremely slight.

History. ceding century, and was himself followed by Ruysch, whose *Theatrum Universale Animalium Omnium* may be regarded as a second edition of Johnston's work. The *Natural and Medical History of the East Indies*, by Bon-tius, appeared in 1658, and contained descriptions of various birds at that time new. Soon afterwards Perrault, Borrichius, and Bartolinus, began to furnish the earliest modern contributions to the anatomy of the feathered race.

Willughby's *Ornithologia* (a posthumous work, believed to have been greatly amended and increased by Ray) was published in 1676. The first edition is in Latin, but an English translation, enlarged, made its appearance two years after. Ray's own *Synopsis Methodica Avium (et Piscium)* was likewise published posthumously, under the care of Dr Derham, in 1713. The writings of these authors are remarkable, as manifesting an approach to a more natural system of arrangement than had hitherto prevailed; but as they have been so frequently analysed, we deem it unnecessary to occupy our space with any detailed exposition of their views. Baron Cuvier has termed Ray "le premier véritable méthodiste pour le règne animal, guide principal de Linnæus dans cette partie." In Sir Hans Sloane's *Voyage to Jamaica, &c.* (1707-25), we have notices of various birds, accompanied by rather poor engravings; but the work was of great use to science in England, by the attention and emulation which it excited in regard to natural objects, of which the author had brought together upwards of 36,000, besides 200 volumes of preserved plants. His collections formed the original basis of the British Museum. A showy but inaccurate work by Marsilli (1726) is devoted to an interesting subject, the birds of the banks of the Danube. Albin's *Natural History of Birds*, in 3 vols. 4to (1731-38), contains above three hundred coloured figures of no great merit. Yet it was afterwards reprinted in French, with additions, at the Hague. About the same period was published Catesby's *Natural History of Carolina, Florida, and the Bahama Islands*, in 2 vols. folio, and appendix (1731-43), with numerous coloured plates of birds and other beings. Frisch's excellent work on German birds (*Vorstellung der Vogel Deutschlands*) was commenced at Berlin in 1734, and was not completed when the author died. It was continued by a stranger, and a collected edition of the whole work, with two hundred and fifty-five plates, was published in 1763. Although by no means highly finished, these engravings are accurate, and exhibit a good deal of the truth of nature. The arrangement is defective, and retrogrades from that of Ray. Seba's great, or rather large work, the *Locupletissimi rerum naturalium Thesauri accurata descriptio*, was being carried on during this period at Amsterdam, in four volumes folio (1734-65). It is unworthy of being quoted, except in reference to the plates.

By this time the illustrious reformer of systematic natural history had made his appearance as an author; the first edition of the *Systema Naturæ*, consisting of only fourteen pages folio, having been published at Leyden in 1735, when Linnæus was not more than eighteen years of age. It ran through twelve editions in little more than thirty years; the twelfth impression, the last which the author could himself revise, appearing at Stockholm in 1766-68. The influence exercised by the writings of the great Swedish naturalist is too important to admit of our proceeding farther without exhibiting a view of his classification, so far at least as concerns the feathered race. The following table presents an outline of the Linnæan arrangement of birds, which he divides into six primary groups called orders.

ORDER I. ACCIPITRES, or birds of prey. The bill more or less curved, the upper mandible dilated, or armed with

a tooth-like process near the tip; the feet short, robust, with acute hooked claws. **History.**

Genus Vultur. Vultures. Beak hooked; head bare: eight species.

Falco. Eagles and hawks. Beak hooked; head feathered: thirty-two species.

Strix. Owls. Beak hooked, feathers at its base directed forwards: twelve species.

Lanius. Shrikes. Beak straightish, notched: twenty-six species.

ORDER II. PICÆ. The bill cultriform, with the back convex; the feet short, rather strong.

Genus Psittacus. Parrots. Beak hooked; upper mandible furnished with a cere: forty-seven species.

Rhamphastos. Toucans. Beak very large, hollow, convex, serrated; both mandibles incurved at the tip: eight species.

Buceros. Hornbills. Beak convex, curved, cultrate, large, serrated; forehead covered by a horny plate: four species.

Buphaga. Beef-eaters. Beak straight, somewhat quadrangular; the mandibles bulging: one species.

Crotophaga. Plantain-eaters. Beak compressed, half egg-shaped, arched, keeled on the back: two species.

Corvus. Crows. Beak convex, cultrate; nostrils covered by recumbent bristly feathers: nineteen species.

Coracias. Rollers. Beak conical, convex, straight, acute; upper mandible slightly longer, and indistinctly notched: twenty species.

Gracula. Grakles. Beak cultrate, convex, somewhat bare at the base: eight species.

Paradisæa. Birds of Paradise. Beak covered with the downy feathers of the forehead; feathers of the sides long: three species.

Trogon. Curucuis. Beak shorter than the head, cultrate, hooked, serrated: three species.

Bucco. Barbets. Beak cultrate, laterally compressed, notched at the tip, incurved, opening to beneath the eyes: one species.

Cuculus. Cuckoos. Beak roundish; nostrils with a prominent margin: twenty-two species.

Yunx. Wrynecks. Beak roundish, sharp pointed; nostrils concave: one species.

Picus. Woodpeckers. Beak angular, straight, the tip wedge-shaped; the nostrils covered with recumbent bristly feathers: twenty-one species.

Sitta. Nut-hatches. Beak awl-shaped, roundish, straight: three species.

Todus. Todus. Beak awl-shaped, a little flattened, obtuse, straight, with spreading bristles at the base: two species.

Alcedo. King-fishers. Beak three-cornered, thick, straight, long: fifteen species.

Merops. Bee-eater. Beak curved, compressed, keeled: seven species.

Upupa. Hoopoes. Beak arcuate, convex, a little compressed, rather obtuse: three species.

Certhia. Creepers. Beak arcuate, slender, acute: twenty-five species.

Trochilus. Humming-birds. Beak slender, longer than the head, its tip tubular: twenty-two species.

ORDER III. ANSERES. Web-footed water-fowl. Bill smooth, covered with epidermis, enlarged at the tip; the toes united by a web, the legs compressed and short.

Genus Anas. Swans, geese, ducks. Beak lamellated at the margin, convex, obtuse: forty-five species.

History. Genus *Mergus*. Mergansers. Beak denticular cylindrical, the tip hooked: six species.

Alca. Auks. Beak short, compressed, convex, furrowed, the lower mandible with a prominent angle: five species.

Procellaria. Petrels. Beak a little compressed; the upper mandible hooked, the lower channelled and compressed at the tip: six species.

Diomedea. Albatrosses. Beak straight; upper mandible hooked at the tip, lower abrupt: two species.

Pelecanus. Pelicans, solan-geese, cormorants. Beak straight, the tip hooked, unguiculate: eight species.

Plotus. Darters. Beak straight, sharp-pointed, denticulate: one species.

Phaeton. Tropic birds. Beak cultrate, straight, acuminate: two species.

Colymbus. Divers. Beak slender, straight, sharp-pointed: eleven species.

Larus. Gull. Beak straight, cultrate, the tip slightly hooked, the lower mandible with an angular prominence: eleven species.

Sterna. Terns or sea-swallows. Beak slender, nearly straight, acute, compressed: seven species.

Rynchops. Skimmers. Beak straight; upper mandible much shorter, lower abruptly terminated: two species.

ORDER IV. GRALLÆ. *Waders or shore-birds*. Bill somewhat cylindrical; the feet long, bare above the tarsus, and formed for wading.

Genus *Phaenicopterus*. Flamingoes. Beak incurvated as if broken, denticulate; feet webbed: one species.

Platalea. Spoon-bills. Beak flattish, the tip dilated, rounded, and flat: three species.

Palamedea. Screamers. Beak conical; the upper mandible hooked: two species.

Mycteria. Jabiru. Beak acute; lower mandible trigonal, ascending; upper three-cornered, straight: one species.

Cancroma. Boat-bills. Beak bulging; the upper mandible resembling a boat with the keel uppermost: two species.

Ardea. Herons and cranes. Beak straight, acute, long, a little compressed, with a furrow from the nostrils to the tip: twenty-six species.

Tantalus. Ibis. Beak long, slender, arcuate; face bare: seven species.

Scolopax. Snipes and curlews. Beak long, slender, obtuse; face feathered: eighteen species.

Tringa. Sand-pipers, or shore-larks. Beak roundish, as long as the head; nostrils linear; feet with four toes: twenty-three species.

Charadrius. Plovers. Beak roundish, obtuse; feet with three toes; twelve species.

Recurvirostra. Avosets. Beak slender, recurved, pointed, the tip flexible: one species.

Hematopus. Oyster-catchers. Beak compressed, the tip wedge-shaped: one species.

Fulica. Coots. Beak convex; upper mandible arched over the lower, which has a prominent angle: seven species.

Parra. Jacanas. Beak roundish, rather blunt; forehead wattled; wings spurred: five species.

Rallus. Rails. Beak thicker at the base, compressed, acute: ten species.

Psophia. Trumpeter. Beak conical, convex, rather sharp; the upper mandible longer: one species.

Otis. Bustards. Beak with the upper mandible arched: four species.

Struthio. Ostrich and cassuary. Beak somewhat conical; wings unfit for flying: three species.

History. ORDER V. GALLINÆ. *Poultry and other gallinaceous birds*. Bill convex, the upper mandible arched over the lower, the nostrils arched with a cartilaginous membrane. Feet with the toes separated, and rough beneath.

Genus *Didus*. Beak contracted in the middle, with two transverse rugæ; the tip of both mandibles bent inwards: one species, now extinct.

Pavo. Pea-fowl. Head covered with feathers, those of the rump elongated, with eye-like spots: three species.

Meleagris. Turkeys. Head covered with spongy caruncles; the throat with a longitudinal membranous wattle: three species.

Craz. Curassoes. Beak with a cere at the base; head covered with recurved feathers: five species.

Phasianus. Domestic fowls and pheasants. Sides of the head bare: six species.

Numida. Guinea-fowls. Carunculated wattles on each side of the face; head with a horny crest: one species.

Tetrao. Grouse and partridges. Bare papillæ near the eyes: twenty species.

ORDER VI. PASSERES. *Passerine birds, and others*. Bill conical, sharp pointed; feet slender, the toes separated.

Genus *Columba*. Pigeons. Beak straight; nostrils with a tumid membrane: forty species.

Alauda. Larks. Beak slender, pointed; tongue slit; hind claws very long: eleven species.

Sturnus. Starlings. Beak slender, pointed; flattened towards the point: five species.

Turdus. Thrushes. Beak subulate, compressed, notched: seven species.

Ampelis. Chatterers. Beak awl-shaped, depressed at the base, notched: seven species.

Loxia. Gross-beaks, bullfinches, &c. Beak conical, bulging at the base: forty-eight species.

Emberiza. Bunting. Beak somewhat conical; lower mandible broader: twenty-four species.

Tanagra. Tanager. Beak notched, awl-shaped, conical at the base: twenty-one species.

Motacilla. Wagtails and warblers. Beak awl-shaped; tongue jagged; claw of the hind toe of moderate length: forty-nine species.

Pipra. Manakin. Beak awl-shaped, feathers at its base directed forwards; tongue abrupt: fourteen species.

Hirundo. Swallows. Beak very small, depressed at the base, incurved; the mouth wider than the head: twelve species.

Caprimulgus. Goat-suckers. Beak very small, incurved, depressed at the base; large bristles; the mouth very wide: two species.

The amount of species in the class of birds with which Linnæus had to form his system did not greatly exceed *nine hundred*. Yet with what admirable tact has he seized upon the characteristic forms which so long served as the nuclei around which so many other species were assembled! It is true that his arrangement, like all other inventions of human genius, is liable to many objections, and may not suit the subject in the wide extent acquired in recent times;—but when we see how closely his ordinal divisions accord even with the most elaborate arrangements of modern days, and how gracefully his generic groups may now be formed into more extended families, each retaining such strong affinities in its constituent parts, we the more incline to marvel at the two following circumstances;—1st, That Linnæus himself should have so far advanced before his age, and anticipated the labours of posterity: 2d, that that posterity, or such portion of the same as in-

History. cline not seldom to sneer at his unprecedented and even now unequalled labours, should not perceive that it is to his system they are indebted for almost all that is of any value in their own. But on this subject we shall not here enlarge.

It has been sometimes remarked, that the characters given by Linnæus to his orders are totally inapplicable to many of the species which each contains. Thus the vultures, it is said, which belong to the first order, have no projecting processes on the upper mandible; the parrots, which are referred to the second, have the bill hooked, not cultriform, and bear no resemblance to the other species; among the Anseres, which are characterised as having the bill smooth, covered with epidermis, and enlarged at the tip, are the gannets, with a bare and pointed bill, and the divers, terns, and gulls, with bills not at all answering to the description given; among the Grallæ, with a cylindrical bill, are the ostrich, with a short depressed one, the canchroma, with one resembling a boat, the spoon-bill, the heron, the flamingo, and others, the bills of which differ from each other as much as from those of the snipes and curlews; the character given to the bill of the Gallinæ agrees with that of many Passeres; and the wag-tail, the swallow, the tit-mouse, the red-breast, and numerous other small birds, have bills very different from those of the goldfinch, bunting, bullfinch, and cross-bill, which, nevertheless, are all defined under the same order, and by a similar phrase.¹ We believe the truth to be, that the more natural an order is, the greater the difficulty becomes of expressing its characters in a single line, in accordance with the briefness of the Linnæan method,—because none of these characters, taken in disconnection, remain unmodified throughout the extended series of beings which they are intended to define. There is always a blending or transition towards other groups, so that the character expressed in words must be regarded as applying, in force rather to certain species which exemplify the whole, and towards which the others *tend*, than to the entire assemblage. Now the Linnæan genera are often natural as family groups, though their constituent portions may not accord with the definition; and as they become extended, or rather filled up, by the discovery of new species, the difficulty increases. Many of the modifying species, or connecting links, were totally unknown in the time of the great Swedish observer, who seized chiefly upon the more prominent and tangible points; and the necessity of forming new subdivisions in no way invalidates his claims upon the gratitude of all lovers of the *lucidus ordo*. At the same time his early disciples erred (though less grossly than many of the later renegades) in viewing all living things as merely destined to clothe with flesh and blood the gigantic frame-work which he had erected,—as if his exposition of the system of nature were in fact itself that system,—as if the highest attainments of any one, however gifted, in either art or science, were ever more than the passionate expression of some dim vision of truth, perceived through the influence of the love of knowledge. With all the lights of modern method, and the vaunted improvements in classification, see we not still “through a glass darkly?” Have not some of those who talk slightly of the Swedish sage never contrived to see through the glass at all?

During the thirty years which elapsed between the first and twelfth editions of the *Systema Naturæ*, several important additions were made to Ornithology from other quarters. Edwards, especially, in his *Natural History of Birds*, and other rare undescribed *Animals*, and in his *Gleanings in Natural History*, amounting in all to seven

History. volumes 4to (1743 and after years), made known in a rough but recognisable style, many new and interesting species. “C'est le recueil,” says Cuvier, “le plus riche pour les oiseaux après les planches enluminées de Buffon.” During the same period a letter was published at Pappenheim, on the birds of the Black Forest, by J. H. Zorn, *Epistola de Avibus Germaniæ, præsertim Sylvæ Hercyniæ*, which contains many excellent observations; and the correspondence was afterwards extended by Brückmann in his *Aves in Germaniâ obviæ Epistolæ Itinerar.* cent. ii. epist. 18, and *Aves Sylvæ Hercyniæ*, *ibid.* epist. 17. In Anderson's *Natural History of Iceland and Greenland* (1750), we have among the earliest authentic notices of the Zoology of these northern regions. Klein and Maering each published systematic works, but based on very artificial principles, at this epoch. In Brown's *Civil and Natural History of Jamaica*, there are several ornithological contributions; and we may here name another excellent English work, Borlase's *Natural History of Cornwall*, which appeared at Oxford in 1758. In 1760 Brisson published his great systematic *Ornithologie*, in six volumes 4to, still of value for the minute though laborious exactness of the descriptions. His method is founded entirely on the form of the bill and feet, the number of the toes, and the manner in which these are united, with or without membrane, to each other. The *Ornithologia Borealis* of Brunnich appeared at Copenhagen in 1764.

The *Storia Naturale degli Uccelli*, printed at Florence in 1767, is the most extensive of all the Italian works on Ornithology, after that of Aldrovandi. It is frequently named by Temminck and other modern writers, most of whom, however, from their vague references, may be safely inferred to quote at second hand. It consists of a large collection of plates both of indigenous and exotic birds, executed with sufficient exactness, considering the slight practice which obtained in those days in the representation of natural objects. The position of most of the figures, as Signor Savi remarks, is forced and unnatural; and we may see at once that the artist was guided more by his own fancies than the accustomed observance of living nature. “*Illuminatio non semper optima, nec optimus semper avium situs*,” are the observations made by Bœhmer.² The plates were engraved from drawings in the collection of a Florentine patrician, the Marchese Giovanni Gerini, a passionate lover of Ornithology, who passed much of his time in collecting, and causing to be described and figured, whatever birds he could procure from every clime and country. After his death some learned men, unfortunately not much skilled in Ornithology, supposing either that general erudition might suffice for science, or that the superficial study of a few books might compensate the want of laborious observations carried on from year to year, undertook to publish Gerini's uncompleted work, to fill up the voids which he had left, and even to alter what he had already done. They thus compiled a superficial text, in which they confused the classification, mistook the species, omitted several of the most interesting, and neglected the localities,—so that a work which, in the hands of an able editor, might have added a new glory to the already illustrious literature of Italy, became nothing more than a disorderly collection of figures. It is, however, of some value, chiefly as containing representations of species not previously known, such as *Falco cenchris*, *Fringilla cisalpina*, *Sylvia provincialis*, *melanocephala*, and *melanopogon*, *Sterna leucoptera*, &c.

From the year 1767 onwards, Pallas, in his *Spicilegium Zoologicum*, the narrative of his various *Travels*, and the *Acta* of the Royal Academy of St Petersburg, contributed to Ornithology, as to most other branches of zoological science;

¹ Macgillivray's *Lives of Zoologists*, vol. i. p. 279.

² *Bibliotheca Scriptorum Historiæ Naturalis*, &c. tom. iii. p. 502.

History. and about the same time the industrious Pennant was actively engaged in his important labours. His numerous well-known works need not be here particularised. The great collection published at Nuremberg by Schligmann in 1768, though amounting to nine volumes folio, including an indifferent text, seems chiefly copied from preceding works, such as those of Catesby and Edwards. In 1770 and following years, Noseman, in conjunction with Sepp the engraver, published, in Dutch, his *History of the Birds of the Low Countries*. The concluding fasciculi are by Houttuyn. Baron Cuvier thinks the figures "remarkable for their elegance." Mr Swainson regards them as "poor and unnatural." The year 1770 is farther marked as an important epoch, by the appearance of the first two volumes of the *Histoire Naturelle des Oiseaux*, by Buffon. That illustrious writer was the first to clothe the descriptive portion of the science with colours as bright and varied as those which beautify the fairy forms of which he treats, but which had hitherto been viewed as it were only by the half-closed eye of the technical describer. The *Planches Enluminées*, afterwards published by Daubenton the younger, in illustration of Buffon's work, amount to above a thousand plates of birds, being the greatest and most important collection yet achieved in this department. In 1774 we have the *Elementa Ornithologica*, by Schæffer, whose system rests entirely on the legs and feet of birds, the primary sections being divided into *nudipedes* and *plumipedes*, while the orders and genera are determined by the number, position, and connection of the toes. He never employs the bill when he can help it; from which we may infer the nature of the work, and its probable utility to the student.

The *Voyages aux Indes*, &c. by Sonnerat (1775 and succeeding years), contains figures and descriptions of many new exotic species. Scopoli's *Introductio ad Historiam Naturalem*, published at Prague in 1777, exhibits a systematic distribution of birds, based on the form of the scales which cover the tarsi. Thus the species which, like the generality of the accipitrine kinds, parrots, the gallinæ, grallæ, and palmipedes, have those parts covered by small polygonal scales, form the section called *retipedes*; while the others, which have the tarsi protected in front by semicircular plates, bordered behind on each side by a longitudinal furrow, constitute the *scutipedes*. The general result, however, of this view is by no means successful. In 1776 Francesco Cetti published his *Uccelli di Sardinia*, a small octavo volume, containing descriptions of only a portion of the Sardinian birds, but valuable, from its notices of their habits, and the description of various new species.

Latham's *General Synopsis* commenced in 1781. However faulty in relation to the present state of the science, it was a work of great merit for its time, and contains, under not very appropriate names, by no means inaccurate descriptions of many rare birds, some of which have since been published, by more recent writers, as entirely new. Under this head we may mention both the *Index Ornithologicus* of the same author (1790), and his greatly enlarged and more modern work, the *General History of Birds*, ten volumes 4to, 1821-24, which combines the two preceding (with their supplements); but is, we regret to say, a mere combination of those rather obsolete materials, without critical discrimination, or any correction of the ancient errors. There is great increase without much progression. Nearly contemporaneous with Latham's first work, we find contributions to Ornithology by Gilius, Merrem, and Jacquin. About 1783 Mauduit commenced the Ornithology of the *Encyclopédie Méthodique*, for which Bonnaterra formed the system of classification which accompanies the volume of indifferent plates. Of the descriptive portion an excellent modern continuation, if not completion, has been published by M. Vieillot, in three vo-

History. lumes 4to, 1823. Sparrmann, a pupil of Linnæus, and a well-known traveller, published in 1786 the *Museum Carolsonianum*, in which several new species are represented and described. In 1787 R. L. Desfontaines (in the *Mémoires de l'Académie des Sciences*) contributed some notices of birds which frequent the coasts of Barbary; and, in the same year, Martinet, who had acted under the younger Daubenton as a superintendent of the *Planches Enluminées*, took it into his head to publish, on his own account, a collection of figures and descriptions of birds, amounting to no less than nine volumes octavo. Their number was not more alarming than their nature.

In 1789 and following years, J. F. Gmelin published the thirteenth edition of the *Systema Naturæ* of Linnæus. "Son travail," says Baron Cuvier, "tout indigeste et dénué de critique et de connaissance des choses, est cependant nécessaire, comme la seule table un peu complète de ce qui à été fait jusque vers 1790." About a volume and a half is devoted to Ornithology. White's *Journal of a Voyage to New South Wales* appeared in 1790, forming an interesting addition to the natural history of a country which still offers a vast field for zoological research; and soon afterwards Shaw announced his *Zoology of New Holland*, which advanced no farther than a few fasciculi. We have likewise in 1790 the *Fauna Grœnlandica* of Otho Fabricius, a work of great merit for the time, and still holding a high place in the estimation of the naturalist, from the accuracy of its descriptions, although in some instances the names are misapplied. In 1792 M. Beseke published in German his materials for the *Natural History of the Birds of Courland*. The works by Lord, Hayes, Lewin, and others, which appeared about this epoch, in illustration of the birds of Great Britain, were so soon afterwards superseded by the admirable and unequalled wood engravings by the inimitable Bewick, that it is scarcely necessary to bring their names to the reader's recollection. We may close our imperfect sketch of the Ornithology of the eighteenth century by the mention of Cuvier's first work, the *Tableau Élémentaire d'Histoire Naturelle* (1798), which contains the methodical distribution of birds, which he afterwards completed in his *Règne Animal*.

We may commence the present century with the title of Daudin's work, the *Traité Élémentaire et complet d'Ornithologie*, two vols. 4to, 1800. It is an unfinished compilation, of no great merit, containing only the accipitrine birds, and a portion of the Passeres. Although Le Vaillant commenced his magnificent series of ornithological illustrations during the preceding season, and continued them at intervals for several years, we shall here group together the most important, for the convenience of the reader: 1st, *Histoire Naturelle des Oiseaux de l'Afrique*, six vols. 4to, 1799-1800. The plates amount to 300, but are inferior to those of the other works of the same author. 2d, *Histoire Naturelle d'une Partie d'Oiseaux Nouveaux et Rares de l'Amérique et des Indes*, one volume 4to, 1801. This volume illustrates the *Buceridæ* or horn-bills, and the *Amplidæ* or fruit-eaters. 3d, *Histoire Naturelle des Perroquets*, 2 vols. 4to, 1801-5. Almost all the plates (139 in number) of this exquisite work are from drawings by Barrabaud, an almost unrivalled artist in the ornithological department. 4th, *Histoire Naturelle des Oiseaux de Paradis, et des Rolliers, suivie de celle des Toucans et des Barbus*, 2 vols. folio, 1806. "Equally splendid," says Mr Swainson, "with the preceding. The size and extraordinary plumage of the paradise birds require a scale fully equal to the dimensions of this volume, which exceeds any other of the author's in the beauty and splendour of its contents." We believe that the two volumes, though generally regarded as one series, were published separately, with distinct titles. 5th, *Histoire Naturelle des Promerops, et des Guépriers*, 1 vol. folio, 1807. This rare and beautiful volume

History. sometimes occurs alone, sometimes as forming volume third of the preceding series. A complete collection of Le Vaillant's works forms of itself a noble gallery of ornithological portraits. The letter-press, more especially that of the *Oiseaux d'Afrique*, is also of great value, and will be studied with additional advantage by those familiar with the delightful narrative of his first and second Travels into the Interior of Africa, 1790-95.

As belonging to the same class of works, and also of excellent execution, may be mentioned Desmaret's *Histoire Naturelle des Tangaras, des Manakins, et des Todiers*, 1 vol. folio, 1805. M. Vieillot, who died in 1828, after a very active career in Ornithology, is the author of the following works, all of a sumptuous character, and of considerable value in their way, though inferior in beauty to those of the two preceding authors. *Histoire Naturelle des plus beaux Oiseaux Chanteurs de la Zone Torride*, 1 vol. folio, 1805;—*Histoire Naturelle des Oiseaux de l'Amérique Septentrionale*, 2 vols. folio, 1807;—*Galerie des Oiseaux*, 4 vols. 4to, 1826, an extensive series of figures, chiefly from the collection of the museum in the Garden of Plants. M. Vieillot is likewise the continuator of Audebert's *Histoire des Oiseaux dorés, ou à reflets métalliques* (2 vols. folio, commenced in 1802); and has written largely on systematic Ornithology in the *Encyclopédie Méthodique (Ornithologie)*, by the Abbé Bonnaterre, continued by M. Vieillot, 3 vols. 4to, besides the plates, Paris, 1823; and in the *Nouveau Dictionnaire d'Histoire Naturelle*. Lastly, he indicated various new groups, or at least a variety of groups under new names, in his *Analyse d'une Nouvelle Ornithologie Élémentaire*, Paris, 1816; a work which seems to have occasioned great offence to M. Temminck,¹ and some dissatisfaction to Baron Cuvier.²

Alexander Wilson's admirable *American Ornithology, or Natural History of the Birds of the United States*, was published in nine volumes quarto (including Mr Ord's Supplement) between 1808-14. It still maintains its character as a work of the highest value, and although it has been since surpassed by other works in elegance of design and beauty of colouring, its descriptive or narrative portion has been scarcely equalled. Of this most remarkable production several editions have been published in America, and two in this country, viz. one by Professor Jameson, in a cheap and commodious form (four small volumes of Constable's *Miscellany*, No. 68—71, 1831), with the advantage of a systematic arrangement of the original materials,—another by Sir William Jardine (in three large 8vo volumes, 1832), with plates, and consequently of higher price, but enriched by numerous notes of great value.

We may here name the *General Zoology*, in fourteen volumes octavo, 1800-26, commenced by Dr Shaw, and concluded by Mr Stephens. The last seven volumes are devoted to Ornithology. Most of the plates are copies. Illiger's excellent *Prodromus Mammalium et Avium* was published at Berlin in one volume octavo, 1811. It establishes several new and important genera.

The first edition of the *Règne Animal* of Baron Cuvier (four vols. 8vo) appeared in 1817; the second (in five vols. 8vo) was published in 1829. We need say nothing of the surpassing excellence of a work which cast the whole subject of Zoology into a new and more natural form, nor of the unequalled labours of the illustrious author, by whom the structure and characters of so many important groups have been brought from darkness into light. The general features of his system have, with few exceptions, been steadily adhered to throughout the zoological treatises of

History. this Encyclopædia, and (which is more to be admired) do equally pervade and illumine the labours of many modern authors who yet place themselves in opposition to his doctrines, and seem to have forgotten, or been blinded by, the dazzling source from which they drew their "golden light;" as if the false though gorgeous glory of a cloud could of itself adorn the beauty of the azure heavens,—as if the reflection of a sparkling river were any thing more than the borrowed lustre of the "Great Apollo." Let the reader rest assured, that however praise-worthy may be the skill and devotedness of our ingenious system-makers, or however valuable may be the materials which they have brought to bear upon isolated portions of nature's most majestic kingdom, they are yet separated, by the will of God, in head and hand, "longissimo intervallo," from their great master. This is no reason, but the reverse, for their ceasing to exercise their useful talents and natural powers of observation with assiduity and patience; as becomes alike the aspiring philosopher and the humble Christian;—but let no man mistake "the spirit he is of," nor suppose an owl an eagle, seeing that not in every acceptance of the phrase is it true, that "a living dog is better than a dead lion."

The natural history of the birds of Germany has been amply and successfully illustrated by the well-known works of Naumann (father and son), by those of Bechstein, and of Messrs Meyer and Wolf. We owe to M. Leisler a Supplement to the work of Bechstein (Hanau, 1812-13), and of Naumann's *Naturgeschichte der Vogel Deutschlands*, a second edition (in octavo), with beautifully coloured plates, was commenced in 1820, but has not yet attained completion. Meyer and Wolf's *Taschenbuch der Deutschen Vogelkunde* now amounts to three volumes, and is filled with excellent observations, while their large illustrated work on German birds, commenced so far back as 1804, and recently brought to a conclusion, is one of the most beautiful with which we are acquainted. M. Brehm published his *Beitrage zur Deutschen Vogelkunde* in 1820-22, in three large volumes, filled with minute details, which exhibit an accurate practical knowledge of the science. The author's views of species are peculiar. His *Lehrbuch der Naturgeschichte aller Europäischen Vogel* (two volumes) was published in the following year. In this, too, he surely describes local races, or accidental varieties, as distinct species. To M. Brehm we likewise owe several fasciculi of a work commenced in 1824, and published at intervals, under the title of *Ornis*. It consists of memoirs and memoranda, by various authors, relating chiefly to Ornithology. Lastly, we may here name his *Handbuch der Naturgeschichte aller Vogel Deutschlands* (Ilmenau, 1831), forming a goodly volume of 1100 pages octavo (with plates), which, M. Temminck remarks, may be reduced to at least one half, by suppressing the numerous indications of what the author calls *sub-species*. His system is partitioned into twenty-three orders, variously subdivided, and containing 196 genera.

Some important additions have been made of late years to the Ornithology of northern countries. The birds of Sweden are described by Professor Nilson of Lund, in his *Ornithologia Suecica*, Copenhagen, 1817-21. The same author published a *Skandinavischen Fauna* in 1824; and a much more sumptuous work appeared at Lund in 1832, under the title of *Illuminerade figurer till Skandinavien Fauna, mit text*. The first volume contains, besides quadrupeds, seventy-five figures of birds. In 1822 M. Boié gave forth his *Tagebuch gehalten auf einer Reise durch Norwegen*, in which, along with the narrative of his travels, he furnishes many valuable observations on the

¹ See his *Observations sur la Classification Méthodique des Oiseaux*, &c. 1817; and *Mannuel d'Ornithologie*, Introduction to the second edition, p. x.

² *Règne Animal*, second edition, tom. i. note to Preface, p. 23.

History. history and manners of the birds of Norway. The same author published a work under the title of *Ornithologische Beiräge*, in 1824. M. Faber's excellent little volume, the *Prodromus der Islandischen Ornithologie*, appeared in 1822. It contains most interesting accounts of the birds of Iceland, especially the aquatic kinds; and not less valuable is his later publication, *Über das Leben der hoch-nordischen Vogel*, 1825, in which we have many acceptable observations on the geographical distribution, and the modes of life, of northern species. While on the subject of northern birds, we need scarcely recall to the reader's remembrance the various appendices to the *Voyages of Captains Parry and Franklin*,—Captain Sabine's *Memoir on the Birds of Greenland* (Linn. Trans. vol. xii.),—or the beautiful work by Dr Richardson and Mr Swainson on the birds of Northern America, which constitutes the second volume of the *Fauna Boreali-Americana*, 1831.

We have few systematic works devoted to the Ornithology of the more southern countries of the European continent. We are ourselves acquainted only by name with the *Ornitologia dell' Europa Meridionale* (dedicatio signata 1772), in fol. max., by Clement Bernini, a teacher of drawing. The birds of France in general are described by M. Vieillot in the corresponding portion of the *Faune Française*, an octavo work, still in course of publication; and those of Provence in particular, by M. Polydore Roux in his *Ornithologie Provençale*, 1825. Of a more general character, though not without its bearings on our present subject, is the *Histoire Naturelle de l'Europe Meridionale* by M. Risso of Nice, in five volumes 8vo, 1826. We have already had occasion to name the *Storia Naturale degli Uccelli*, published at Florence in 1767; and Cetti's more restricted one, *Gli Uccelli di Sardigna*, 1776. In more recent times (1811), Professor Bonelli of Turin published a *Catalogue des Oiseaux du Piémont*, containing two hundred and sixty-two species. In 1822, Giambatista Baseggio inserted in the twenty-eighth volume of the *Biblioteca Italiana* an enumeration of the birds observed by him in the neighbourhood of Bassano, amounting to a hundred and thirty-seven species. In 1823, Fortunato Luigi Naccari printed at Treviso his *Ornitologia Veneta, ossia Catalogo degli Uccelli della provincia di Venezia*, in which he notices two hundred and six species. In the same year Savi the younger published, at Pisa, his *Catalogo degli Uccelli della Provincia Pisana, e loro Toscana Sisonimia*. The species are classed in accordance with M. Temminck's system, and amount to two hundred and twenty. From 1819 to 1826, Professor Ranzani of Bologna gave forth his excellent *Elementi di Zoologia*, of which the third volume, consisting of nine parts, is devoted to the natural history of birds. It is, however, a general system, treating of exotic as well as of indigenous kinds; yet a good deal may be gleaned from it regarding the Italian species. A work of more special interest is the *Specchio comparativo delle Ornithologie di Roma e di Filadelfia*, by Carlo Bonaparte, commonly called the Prince of Musignano. In this slight but highly interesting volume (republished in the *Nuovo Giornale de' Letterati* of Pisa), the author compares the Ornithology of two distant regions of Europe and America, lying, however, under nearly the same latitude, and records his observations on their history and manners. Of the species of the Roman territory we had previously scarcely any knowledge, and the Prince makes us acquainted with not fewer than two hundred and forty-seven. By the same author we have also *Osservazioni sulla Seconda Edizione del Regno Animale del Baron Cuvier*, inserted in the tenth and eleventh fasciculi of the *Annali di Storia Naturale* of Bologna; and he has more

recently commenced the *Iconografia della Fauna Italiana*, Rome, 1832,—a sumptuous lithographic work, in large quarto, devoted to Italian zoology. Not more than half a dozen numbers have as yet appeared, and these contain but few examples of the feathered race. Though not relating to Italy, we may here mention our author's other works, viz. *American Ornithology, or the Natural History of Birds inhabiting the United States, not given by Wilson*, with coloured figures, three volumes quarto, Philadelphia, 1825–28 (only the land-birds have yet been published);—*Observations on the Nomenclature of Wilson's Ornithology*, Philadelphia, 1828;—and *Genera of North American Birds, with a Synopsis of the species found within the territory of the United States*, New York, 1828 (published in the *Annals of the Lyceum* of that city). The birds of Liguria are enumerated and briefly described, particularly the immature conditions of the plumage, by Girolamo Calvi in his *Catalogo d'Ornitologia di Genova*, 1828.

The latest but most important work with which we are acquainted on the birds of Italy, is the *Ornitologia Toscana* of Professor Savi, in three vols. 8vo, with additional synoptical tables, Pisa, 1827–31. Though more specially devoted to the birds of Tuscany, it also contains descriptions of all the other Italian species, and may be regarded as a most valuable addition to our knowledge of the feathered tribes of Europe. The southern position and delightful climate of the Italian Peninsula induce the wandering wings of many species elsewhere *rare aves* to wend their way towards the olive groves and richly laden fig-trees of that favoured land,—thus connecting the Ornithology of Europe with that of Africa and other sultry regions.

We may be thought, in some of our preceding notices, to have entered too minutely into the enumeration of descriptive local works, but we have been guided in so doing by two considerations: 1st, That none of our English writers ever make any allusion to Italian Ornithology, except by casual reference to Carlo Bonaparte; and, 2dly, that Buffon has recorded as his opinion, that “le seul moyen d'avancer l'ornithologie historique, seroit de faire l'histoire particulière des oiseaux de chaque pays; d'abord de ceux d'une seule province, ensuite de ceux d'une province voisine, puis de ceux d'une autre plus éloignée; réunir après cela ces histoires particulières pour composer celle de tous les oiseaux d'une même climat; faire la même chose dans tous les pays et dans tous les différens climats; comparer ensuite ces histoires particulières, les combiner pour en tirer les faits, et former un corps entier de toutes ces parties séparées.”¹

The *Natural History of British Birds*, by Donovan, in ten volumes octavo, is a work of no great merit. Its period of publication extends from 1799 to 1816.

To no one of our contemporaries is Ornithology more deeply indebted than to M. Temminck. His *Histoire Naturelle Générale des Pigeons et des Gallinacées*, three volumes octavo, appeared in 1813–15. The portion which concerns the pigeons was also published in folio, with beautiful coloured plates, by Madame Knipp. His *Manuel d'Ornithologie, ou Tableau Systématique des Oiseaux qui se trouvent en Europe*, 1815, consisted at first of a single octavo volume; but a greatly improved and extended edition in two volumes appeared in 1820. Whatever difference of opinion may prevail in regard to the author's system, naturalists are agreed that this is by far the most valuable work we yet possess on the birds of Europe. Its main excellence consists in the attention bestowed upon the sexual distinctions, and the successive changes of plumage from youth to age. The first volume contains, under the title of *Ana-*

¹ *Histoire Nat. des Oiseaux*, Plan de l'Ouvrage.

History. *lyse du Système Générale d'Ornithologie*, a classification of birds in general. Instead of a third edition of his *Manuel*, the author has recently published (in 1835) a third *part*, as a supplement to the first volume, and he is now about to give out a fourth *part*, or supplement to the second volume. These parts contain the corrections and additions rendered necessary by the lapse of many years. But M. Temminck has not confined his attention to the birds of Europe. In 1820 he commenced (in conjunction with M. Meiffren de Laugier) his *Planches Coloriées*, a work intended as a continuation and completion of the well-known *Planches Enluminées* of Buffon. It is printed in both a quarto and a folio form, now amounts to above ninety parts, and will be concluded (so far, at least, as the first great series is concerned) on the publication of the hundredth number. It will then form five volumes, composed in all of five hundred and ninety-five plates, exhibiting seven hundred and fifty-five figures of birds, the majority unknown to prior writers. Each plate is accompanied by corresponding letter-press, containing the generic characters, the description of the species figured, and in many instances by general observations on the distribution and construction of groups. The two concluding numbers are to contain a general index, as well as the tables and titles of the volumes. On the completion of this "century," we trust M. Temminck will be encouraged to proceed to another series, as we know his materials are abundant, if not inexhaustible. It would in truth be desirable that some such established work should be generally regarded as a proper medium for the publication of new or rare subjects in Ornithology, for it is the bane of natural history in general, that every year should be distinguished by the appearance of numerous abortive attempts, which each succeeding season condemns to oblivion. Thus the tax becomes both heavy and unproductive, yet we fear that national pride and personal vanity will long prevent the introduction of a better system. We do not mean to say that we possess not among ourselves individuals competent to do the subject justice, but assuredly there is much labour lost by a want of concentration.

In connection with the labours of the last-named author, we may here mention M. Werner's lithographic work, entitled *Atlas des Oiseaux d'Europe, pour servir de complément au Manuel d'Ornithologie de M. Temminck*, of which thirty-two livraisons have now appeared. M. Temminck had figured a few European novelties in his *Planches Coloriées*, but he appears to have remitted most of his rare indigenous kinds to M. Werner; and we are happy to find he is now in immediate communication, so far as the publication of his European species is concerned, with our zealous and intelligent countryman Mr Gould. This leads us to record the title of one of the most sumptuous and beautifully executed works within the whole range of ornithological illustration, viz. *The Birds of Europe*, by John Gould, F.L.S. now completed in five volumes royal folio. The plates are chiefly from lithograph drawings by Mrs Gould, but many are also by Mr Lear, one of the best ornithological draftsmen the world has yet seen. Mr Gould's other works, all of recent date, and of the same form and character as the preceding, are as follow:—*a Century of Birds, from the*

Himalaya Mountains;—*a Monograph of the Toucans*;—*a Monograph of the Trogons*;—and, *a Synopsis of the Birds of Australia*. The latter is in a more portable form than the others; but it is the author's intention to illustrate the Ornithology of New Holland in the same mode as that in which he has treated the birds of Europe.

To M. Lesson the Ornithologist stands indebted for several publications, both of a sumptuous and useful character. The last edition of his work on humming-birds bears the following title: *Les Trochilidés, ou les colibris et les oiseaux mouches, suivi d'un index général, dans lequel sont décrites et classées méthodiquement toutes les races et espèces du genre Trochilus*, Paris, 1832, with seventy coloured plates. Conjointly with M. Garnot, he has published some figures of birds in the Zoological Atlas to Duperrey's *Voyage autour du Monde*, as well as in his own *Centurie de Zoologie*. His other works specially devoted to our present subject are,—*Manuel d'Ornithologie*, two volumes 18mo, 1829; *Traité d'Ornithologie*, two volumes 8vo (with 119 plates), 1831; and *Histoire Naturelle des Oiseaux de Paradis, des Séricules, et des Epimaques*, one volume 8vo (with 41 coloured plates), 1835.

Mr Swainson's beautiful *Zoological Illustrations* (First Series 3 vols. 8vo, 1820–23, Second Series 3 vols. 8vo, 1832–3) contain representations of many rare and remarkable birds, and yield to none with which we are acquainted, either in elegance or accuracy. By the same author (conjointly with Dr Richardson) we have, as already noted, the *Fauna Boreali-Americana*, Part Second; and (without other aid than his own delightful pencil) several fasciculi of the *Birds of Brazil*. More recently Mr Swainson has entered into a minute as well as extended exposition of the *Natural History and Classification of Birds*, in two volumes (1836–7), which form the ornithological portion of Dr Lardner's Cyclopædia. These will amply repay the most attentive study.

The birds of South America, which, like all the productions of that splendid country, are extremely gorgeous, have been here and there illustrated in various works, and are partially so by Mr Swainson in one of those just named. In Azara's *Voyages dans l'Amérique Méridionale* (1809, 3d and 4th volumes) there are descriptions of many hundred species from Paraguay and La Plata. The ornithological portion of the French edition was translated, with notes, by Sonnini.¹ A great mass of Brazilian species is described and figured in Spix's *Avium Species Novæ*, &c. 2 vols. 4to, 1824–26; while the habits of several of the more curious birds of Demerara are recorded in Mr Waterton's eccentric and well-known *Wanderings*.

The Ornithology of North America has been illustrated in an extremely full and satisfactory manner. Indeed, of the feathered tribes of no country out of Europe, equal in extent, do we possess so ample and accurate a knowledge as we do of those of the United States. We have already mentioned the immortal work of Alexander Wilson, and its excellent continuation by Charles Lucien Bonaparte; but at present we have to record the title of a much more magnificent publication than either, we mean *The Birds of America, engraved from Drawings made in*

¹ The truly important works of Don Felix Azara seem better known to European readers by the French translations than the original Spanish publications. He devoted all his leisure hours, whilst in South America, to the pursuits of natural history, from the year 1782 to 1801. He then transmitted the manuscript of his *Apuntamientos para la Historia Natural de los Quadrupèdes del Paraguay* to his brother, Don Josef Nicolas, who handed it over to a French professor, M. Moreau de Saint Méry, by whom it was translated, and published under the now well-known title of *Essai sur l'Histoire Naturelle des Quadrupèdes du Paraguay*, 2 vols. 8vo, Paris, 1801. The original, however, appeared at Madrid in the following year, with corrections and additions by the author. In 1802 he likewise published his ornithological work under the title of *Apuntamientos para la Historia Natural de los Pajaros del Paraguay y Buenos Ayres*; and this portion of his labours forms the two concluding volumes of the French translation, entitled *Voyages dans l'Amérique Méridionale de 1781 jusqu'en 1801*, 4 vols. 8vo, Paris, 1809. We are glad to understand that Mr W. Perceval Hunter proposes to publish an English translation of both works, from the original Spanish, with notes.

History. *the United States*, by John James Audubon, F. R. S., &c. 3 vols. folio, London, 1831-37; an undertaking which far exceeds in size and splendour all its predecessors in this, or indeed in any other department of Zoology. The dimensions of the work, as we have elsewhere noticed, are such as to enable the author not only to represent the largest birds of the United States, of the size and in the attitudes of living nature, but to figure a great proportion of them in family groups, so admirably conceived and skilfully executed, as really to form historical pictures of the highest interest to the general observer, and of the greatest utility to the student of Ornithology. The completion of each volume of plates is immediately followed by a large octavo volume of descriptive and general history of all the species therein contained. Mr Audubon far excels Wilson as an ornithological draftsman, and often equals him in his lively, eloquent, and interesting details of the life and manners of the feathered tribes. His descriptive volumes are entitled *Ornithological Biography*, or *an Account of the Habits of the Birds of the United States*. They at present amount to three in number; and a fourth and final one, to accompany the concluding fasciculus of his splendid plates, is now on the eve of publication.

An extremely useful and well-concocted work, of less ambitious form than the preceding, is the *Manual of the Ornithology of the United States and of Canada*, by Thomas Nuttall, F. L. S., in two compact octavo volumes, Cambridge and Boston, 1832-34. The author has recently returned from a scientific tour through the great western territories, including an extended range of the Rocky Mountains; and, we doubt not, the public will benefit by whatever account he gives of his researches.

Although we have hitherto confined our bibliographical notices chiefly to the works of foreign writers, we have done so not in consequence altogether of our own poverty, but rather for the more ample information of the English reader, who may be supposed to require less assistance in regard to British authors. We have scarcely even named the *British Birds* of the unequalled Bewick. We name it, and nothing more, believing that every one who delights to see nature in art, is familiarly acquainted with a work which may be keenly relished without any arduous study, but which those who study most will best appreciate and enjoy. Although the descriptive portion is written with accuracy and intelligence, we doubt not it would be advantageous to the author's family, and prove a labour of love to one or more of the many skilful Ornithologists of the present day, that the plates should be re-arranged in conformity with modern views, the supplement incorporated, the synonyms increased, and such rational alterations or additions effected, as would render it the manual of British Ornithology, if not for all time coming, yet for many future years. If accompanied by portions of the author's autobiography, so much the better. We regret that the latter, so racy and original, should have not yet seen the light. The most recent and complete edition of Bewick's *Birds* is that of 1832. A very beautiful preface is prefixed to the one published in 1826.

The most original descriptive works on the birds of Britain are Montagu's *Ornithological Dictionary*, 2 vols. 8vo, 1802, and *Supplement* to the same, 1 vol. 8vo, 1813. These were not only excellent works on *British* birds simply as such, but valuable additions to the actual history of European species,—the chief merit of many of our other publications consisting in their applying the knowledge acquired by foreign writers to our indigenous kinds; whereas Montagu rather gave than borrowed, his observations being almost entirely original. His volumes are now extremely rare in their first form; but a new edition, combining both works in one, was brought out in 1831, with notes, by Mr Rennie.

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History. Dr Fleming, in his *History of British Animals*, one vol. octavo, 1828, enumerates and describes the birds of Britain. Of this work, which has been very useful to some who say rather too little about it, we should desire to see a new edition, remodelled in accordance with the alterations and additions rendered necessary by the lapse of years. It is a publication of great merit.

The letter-press to Mr Selby's folio *Illustrations of British Ornithology* (we mean the second edition, in two vols. 8vo, 1833) forms the best completed work we yet possess in accordance with the modern method of arrangement. Jointly with Sir William Jardine, Mr Selby has also brought out many fasciculi of *Illustrations of Ornithology* (small folio), in which are figured various interesting and curious forms of foreign species; and his well-instructed coadjutor is editor (and of several volumes author) of the *Naturalist's Library*, in which a due portion is successfully devoted to the history and representation of the feathered tribes. Both publications continue at the present time (1838).

One of the most valuable and carefully constructed works with which we are acquainted is the *Systema Avium* of Dr Wagler, pars prima, Stuttgart, 1827. It consists of a series of monographs, not in systematic order, but including several extensive and difficult genera, such as *Picus*, *Columba*, &c. The author unfortunately died not long ago, in consequence of a gun-shot wound accidentally inflicted by himself while sporting, and the non-completion of his work may be regarded as a great loss to Ornithologists. Various additional though detached portions of it, however, may be found in the *Isis*, a German periodical published at Frankfort. Wagler is also the author of the most recent descriptive summary of the parrot tribe, under the title of *Monographia Psittacorum*, one vol. 4to, Munchen, 1835. Our best previous treatise on that gorgeous family was published by the lamented Kuhl, in the *Nova Acta* of Bonn, vol. x. Of illustrated works on the subject, we have already mentioned that of Vaillant; and the English reader need scarcely be reminded of the extreme beauty of Mr Lear's more recent *Illustrations of the Psittacidae*, in one vol. royal folio.

A considerable flock of ornithological authors has recently appeared above the horizon, to enlighten, however, rather than obscure our vision. We shall name a few.

Outlines of the Smaller British Birds, by R. A. Slaney, Esq. 12mo, 1833.

Familiar History of Birds, by the Rev. Edward Stanley, 2 vols. 12mo, 1835.

Manual of British Vertebrate Animals, by the Rev. Leonard Jenyns, 1 vol. 8vo, 1835.

Feathered Tribes of the British Islands, by Robert Muir, 2 vols. 8vo, 1836.

History of the rarer British Birds, intended as a supplement to Bewick, by T. C. Eyton, Esq. 1836.

Of these, and other contemporary writers, the reader will find more ample notice in Mr Neville Wood's *Ornithologist's Text-Book* of 1836.

The following works relate particularly to the more musical of the feathered tribes: *Harmonia Ruralis*, or *Natural History of British Song Birds*, by James Bolton, folio, 1794;—*British Warblers*, by Robert Sweet, F. L. S. 8vo, 1823-32;—*Treatise on British Song Birds*, by Patrick Syme, Esq. 8vo, 1823;—*British Songsters*, by Neville Wood, Esq. 8vo, 1837;—*Cage Birds, their Natural History, Management, &c.* (translated from the German), by J. M. Bechstein, 12mo, 1837.

Mr Yarrell has commenced his much-desired *History of British Birds*, illustrated by a wood-cut of each species, and numerous vignettes. The illustrations are for the most part remarkably accurate as ornithological representations, and of extreme beauty in a pictorial point of view.

Structure. From the author's excellent reputation as a naturalist, as well as from the specimens hitherto published, we should augur that this work, on its completion, will form as valuable a manual of British Ornithology as can be well desired.

Last in our list, though the reverse of lowest in our estimation, stand Mr Macgillivray's characteristic volumes, the *Rapacious Birds of Great Britain* (1836), and the *History of British Birds, Indigenous and Migratory* (vol. 1st, 1837). In regard to these two works, readers may probably differ in their appreciation of some insulated passages, critical or otherwise, not essential to the exposition of the subject in hand; but we think all must agree that they are written in a clear, vigorous, and original manner, and devoid of that rapid spirit of compilation which pervades the labours of so many of the ingenious author's predecessors and contemporaries.

We shall not here enter into any detailed exposition of the internal structure of birds. Our space would not admit of our doing so in a manner likely either to satisfy ourselves or to instruct our readers. The subject is of too great importance to be superficially treated, and a deeper scientific examination is not to be looked for here. We regret to say, there is much reason to accuse the naturalist of confining his attention to the external characters of living beings, which, though important portions of the animal economy, are nevertheless only portions, though too often looked upon as all in all. It is no reason for neglecting the internal structure, that a knowledge of such structure is not required to comprehend the modern systems. This, we must admit, is true; but the systems are thereby so much the more defective. An assured anatomical basis will never cause confusion or contrariety in any good arrangement formed on the groundwork of external characters; for the best of these are sure to conform themselves with all the important modifications of internal structure, while the sooner a bad arrangement is undermined the better. At the same time, that Zootomist would know little of the practical importance of external forms who should not endeavour to connect these with his demonstration of more recondite characters. In truth, however desirable it may be to know the whole of the animal structure, whether external or internal, we must in relation to museum specimens and to zoological collections in general, necessarily have recourse to superficial, or at least external characters, because none other are visible, or indeed exist, in the subjects of natural history as usually preserved; and we should debar a vast multitude from a most delightful study of graceful forms and gorgeous plumage, if we could learn nothing important of beast or bird without prying into all the hidden wonders of its interior. Whatever progress comparative anatomy may in future make, we trust the Zootomist will ever bear in mind that the establishment of good external characters is a matter of the highest and most indispensable importance to the present state and future progress of natural history, of which the practical pursuit will ever mainly depend upon the class of characters in question. As we cannot here enter into the anatomical department of our subject, we shall give, in the subjoined note, the names of a few works likely to interest and instruct the reader.¹ A few paragraphs will suffice for all we have ourselves to say, before entering upon our systematic portion.

The bill, composed of the upper and under mandible, varies almost infinitely in its form in the different genera,

in the determination and construction of which it affords characters of the highest importance. As its modifications will be specially alluded to in our notices of the minor groups, and are moreover accurately represented in the plates which accompany the present treatise, we need not here fatigue the reader by an unnecessary enumeration. A portion at the base of the upper mandible, usually containing the nostrils, and sometimes covered with hairs or feathers, sometimes partially or entirely bare, is called the *cere*. It is very obvious in most birds of prey, but imperceptible in many other species. When we expand the mandibles, we of course perceive the opening to the alimentary canal or digestive organs, which usually consist of the following portions.

The *pharynx* follows immediately after the cavity of the mouth. It leads into the *œsophagus* or gullet, which in many species swells into what is called the *crop*, by some regarded as the first stomach. This is followed by a second enlargement, produced, however, rather by a thickening of the coats than by any increase of capacity within, named the *proventriculus*. It contains numerous glandular sacs interposed between its muscular and mucous coats, which secrete a gastric juice to aid the process of digestion. This proventriculus leads to the *gizzard* or true stomach, by some regarded as the third stomachic expansion. Here the function of digestion is completed. The entrance from the stomach to the small intestine is named the *pylorus*, of which the structure is frequently valvular. The first fold of the small intestine is named the *duodenum*, and after receiving the pancreatic and biliary ducts, it forms various convolutions, and terminates in the rectum or large intestine. The *cæca* are usually placed at the commencement of the latter; its termination is named the *cloaca*.

These parts, it will be borne in mind, are variously modified in the different tribes. In some the expansion called the crop is wanting, or not to be distinguished from the other upper portions of the *œsophagus*; and the powerful muscles which constitute the peculiar strength of the gizzard in granivorous birds are very feeble in the carnivorous and fish-devouring kinds. In some the intestine is long and narrow, in others short and wide, while the *cæca* exhibit a corresponding range, being in certain kinds extremely long, in others merely rudimentary.

Birds are remarkable for the energy of their respiratory functions. Although their lungs are rather small, they are perforated in such a way as to communicate with membranous cells distributed through various parts of the body, and even communicating with the interior of the bones, so that the atmospheric air not only comes in contact with the pulmonary vessels, but with a great proportion of the circulating system. Thus birds have been said to respire by the branches of the aorta, as well as by those of the pulmonary artery. It is thus that the most rapid exercise of the faculty of flight impairs not their power of breathing; and the best-trained hunter that ever bounded rejoicingly over the fences of Leicestershire is far sooner blown than a field sparrow.

The *trachea* or wind-pipe is composed of bony rings. The *upper larynx* is of comparatively simple structure, and of less importance than among the mammiferous class; but farther down, and close upon the bifurcation of the trachea, is the *lower larynx*, the true organ of the voice in birds. The vast bulk of air contained in the interior cells no doubt contributes to the strength of their vocal powers, while the muscles of the inferior portion of the larynx, and

¹ Cuvier's *Leçons d'Anatomie Comparée*; Carus's *Introduction to Comparative Anatomy*, translated from the German by Mr Gore (there is a better and more recent French edition of this work); Meckel's *Traité Général d'Anatomie Comparée*; Grant's *Outlines of Comparative Anatomy*; Mr Owen's article *Aves*, in Todd's *Cyclopædia of Anatomy and Physiology*; and the *Introduction* to Macgillivray's *History of British Birds*, vol. i.

Structure the length, diversified form, and varied movements of that organ, bestow upon it a great facility of modulation.

The anterior limbs of birds, corresponding to the fore legs of quadrupeds, have been converted into wings for the purposes of that aerial locomotion commonly called flight. It is true that some birds cannot fly, that is, leave not the surface of the earth; but these are exceptions to the general rule, and even among such exceptions the great majority use their wings as a propelling power, whether coursing amid dry and barren deserts, or submerged beneath the waves. The bony portions of the wings consist of the *humerus*, the *cubitus*, the *carpal* and *metacarpal* bones, and *fingers*. We shall briefly describe these parts in so far as they are connected with the imposition of the plumage, and consequently with the external characters of the feathered race. The reader, if he so inclines, may here consult Plate CCCLXXXVII. figs. 3 and 4. The *humerus* or arm-bone (*c*) is joined to the body by means of a part of its own upper surface, which articulates with a corresponding cavity between the coracoid bone (*b*) and the scapula or shoulder-blade (*a*). It is directed backwards in repose, and in a position more or less parallel with the spine. The other extremity of the humerus articulates with the *cubitus* or fore-arm, which is composed of the bones called the *ulna* (*d*) and *radius* (*e*), and is so jointed as to fold when at rest in a direction parallel to that of the arm. The *carpus* consists of two small bones (*ff*) placed between the outer extremity of the cubitus and the *metacarpus*. The latter (*g*) usually consists of two bones united at both ends. From the anterior edge of the portion next the carpus, there projects a small bone, considered as analogous to the first digit or thumb, *pollex* (*h*); to the extremity of the outer portion of the metacarpus are usually attached two other digital bones (*i, j*); and to the extremity of its inner portion is frequently appended a smaller bone of corresponding nature. These are the *fingers* of birds.

Now, the connection of the *plumage* with the preceding parts is as follows. Here consult Plate CCCLXXXVII. figs. 1, 2, 5. The small elongated tuft of stiffish feathers which clothe the upper exterior margin of a bird's wing, increasing in size downwards, pointing towards the base of the outer primaries, and commonly called the *alula*, or spurious wing (see S. W. in figs. 1, 2, and 5), springs from the portion we have called the thumb. The *primaries* or greater quill-feathers of the wings, that is, the *ten* outermost feathers, and which constitute the more or less pointed terminal portion (see figs. 1, 1 to 10, and figs. 2 and 5, at P. P.), spring from the digital and metacarpal bones. The *secondaries*, or lesser quill-feathers (figs. 1, 1 to 6, and figs. 2 and 5, at S. S.), which, when the wing is closed, usually cover a portion of the primaries, take their origin from the cubitus or fore-arm; while a third series, inconspicuous in most birds, though very obvious in others, and named the *tertials* or tertiary feathers (fig. 2, T. T.), are derived from the humerus or arm bone. Above these, and lying over that portion of the wing which joins the body (or, as it were, between the wing and back), are the *scapulars* (fig. 2, Sc.), usually of an elongated form, and often distinguished from the surrounding plumage by a difference of tint or marking. Lastly, various ranges of feathers which clothe the upper portion of the wings from the carpal joint backwards, covering the base of the primary and secondary quills, and spreading across from the spurious wing to the scapulars, are named the *wing coverts*, and are distinguished, according to their position, as the smaller coverts (figs. 1 and 2, at Sm. C.), which clothe the upper portion of the wing; the secondary coverts (figs 1 and 2, at S. C.), which pro-

Structure. tect the base of the secondaries; and the primary coverts, (figs. 1 and 2, at P. C.), which perform that office to the primaries. The feathers which clothe the under surface of the wings are named the *under coverts* of those parts; and the terms *upper* and *under tail-coverts* signify the feathers which cover the base of the tail, above or below. But we need scarcely occupy our pages with the numerous particulars which might be brought forward, and which occupy so prominent a space in many ornithological volumes. The terms in most cases explain themselves. When we speak of the crest of a bird, we of course mean to indicate the feathers on its head; and the upper, central, or lower portions of the back, can be respectively nothing more nor less than one or other of these portions. When we mention the point of the bill, we literally mean the point, and there is no word in the English nor in any other language which can express it more clearly. Neither do we think it necessary, in an English work, to give a corresponding Latin phrase for every term we use, more especially as many of these terms cannot be correctly Latinized, and in fact have never occurred at all in any books in that language. Their confinement, therefore, in a circumflexual prison, amid the unembarrassed freedom of the English tongue, is a sad and cruel mockery "of things attempted yet in prose or rhyme;" and we believe is but seldom practised by those who got through Ruddiman respectably in early life. We therefore deem it worse than useless to present an endless catalogue of terms in *Ornithology*, followed by explanations more obscure and ambiguous than the technicalities themselves; but shall rather endeavour either altogether to avoid unknown tongues, or, by the context, to render our meaning obvious to each capacity.¹

Those minute discriminations, so often insisted on, are in truth but seldom necessary in the description of a bird's external aspect, especially of its feathered portions, because large spaces of the plumage have frequently an identical character both in texture and colour. Thus, if the entire head is either black, white, brown, or any other single colour, it would be a waste of words to describe it in any other way than simply as being of that colour; that is, it would be unnecessary to say that the frontal, vertical, occipital, auricular, and ocular feathers of the head were coloured after such a fashion; but if one colour prevails over another, and yet is traversed, or in any way varied by other colours, the precise region, whether frontal or occipital, in which the variation happens should be stated. We would almost say, that our nomenclature of the parts themselves depends to some extent on the distribution of the colours. Thus, of birds with a black abdomen and a scarlet breast, we can easily conceive, that even of the same species two individuals may so considerably differ in the proportional extent of the supposed colours, that the black in one instance shall encroach upon what corresponds to the scarlet of the other, or *vice versa*; but still the phrases "abdomen black, breast scarlet," would suffice for both, though not proportionally the same in each. The fact is, that many of the special regions of a bird are by no means precisely marked, or at least are seldom seen to be so, unless we strip it of its plumage,—an untoward act, however, for one who desires to stuff or otherwise preserve its skin; and therefore some latitude must be allowed in our expression of the external parts.

The next portion to be briefly described is the leg or hinder limb. This is divisible into the *femur*, *tibia*, *tarsus*, and *toes*. See Plate CCCLXXXVII. fig. 3.

The *femur*, or thigh-bone (*k*), is cylindrical, somewhat

¹ A very ample and interesting account of the diversified form of bills, feet, and feathers, will be found in Mr Swainson's *Natural History and Classification of Birds*, vol. i., illustrated by numerous wood-cuts from the elegant pencil of the author.

Structure. curved, usually very short, and always so concealed within the body as not to be apparent as an external portion of the limb. The next division is the leg or *tibia* (*m*), frequently but erroneously called the thigh, probably from its being the uppermost apparent portion. It is usually covered with feathers, though sometimes bare on its lower portion. Then follows the *tarsus* (*n*), that long, slender, exposed portion, so conspicuous in almost all the species, varying considerably among accipitrine birds, rather short in web-footed water-fowl, and greatly lengthened in the majority of shore-birds or waders. Its upper knobby portion, where it articulates with the *tibia*, is the true heel, although generally in colloquial, and not seldom in descriptive language, termed the knee. The prominences of its lower extremity articulate with the *toes*. The latter parts usually amount to four; the hind toe, however, is wanting in many species, and the ostrich is generally supposed to have only two toes, although Dr Riley has demonstrated the existence in that bird also of a rudimentary inner toe. The hind toe is by some regarded as the first, the inner as the second, the middle as the third, and the outer as the fourth toe; and in this order there is a progressive increase in the number of the joints of which each is composed,—the first having two, the second three, the third four, and the fourth five bones. The surface of the tarsus, toes, and sometimes of the base of the *tibia* when that part is exposed, is covered either with plated or reticulated scales, of various forms in different species; and the tarsus is moreover often armed with one or more spurs,—which, however, belong to the cutaneous rather than the osseous system. A general notion of the latter, as it exists in the class of birds, may be acquired by an inspection of the skeleton of the golden eagle just referred to (Plate CCCLXXXVII. fig. 3). We shall here add nothing more upon the subject.

The position, and therefore to a certain extent the nature, of many modern genera, of which we are unable from want of space to give the characters, will be seen in the tabular views with which we terminate the present treatise. A considerable discordance still prevails in regard to the nature and amount of the generic groups in Ornithology,—some writers advocating a numerous subdivision, and consequent restriction, of characters; while others adhere, perhaps too tenaciously, to old associations, which naturally tend to the augmentation of species, in other words, to the extension rather than the increase of genera. The former plan is rendered necessary to a great extent by the vast additions which have been made to our knowledge of groups and of typical species within the present century, and might be deemed advisable among the larger genera even as a mere matter of convenience;—its abuse in the hands of unskilful or inexperienced persons being of course no legitimate argument against it. There is, however, a great deal that is arbitrary and unsettled in whatever principle may be supposed to guide the modern naturalist in the formation of his generic groups. The simplicity and ease of application which characterised the former artificial systems have been lost in their attempted demolition, while the reconstructions now arising (in spite of the abundant though not always acknowledged appropriation of some useful old materials) are not yet so complete and commodious as to afford the same accommodation to the benighted student. Order will no doubt some day spring from chaos, and even already, amid the darkness of the upheaving waters, are many sunny spots of terra firma towards which we fondly steer, “well pleased that now our sea should find a shore.” Naturalists, however, need by no means quarrel with each other, as if there was a certain good to gain, or some great physical truth to be established. “All the great business

of genera and species,” says Locke, “amounts to no more but this, that men make abstract ideas, and, setting them in their minds with names annexed to them, do thereby enable themselves to consider things, and discourse of them, as it were in bundles, for the easier and readier improvement and communication of their knowledge, which would advance but slowly were their words and thoughts confined only to particulars.” “The reason,” he says again, “why I take so particular notice of this is, that we may not be mistaken about genera and species, and their essences, as if they were things regularly and constantly made by nature, and had a real existence in things,—when they appear upon a more wary survey to be nothing else but an artifice of the understanding, for the easier signifying such collections of ideas, as it should often have occasion to communicate by one general term, under which divers particulars, as far forth as they agreed to that abstract idea, might be comprehended.”

The following observations by Mr Vigors may be introduced with propriety in this place, as according closely with our own views on the subject of generic divisions. “But though nature nowhere exhibits an absolute division between her various groups, she yet displays sufficiently distinctive characters to enable us to arrange them into conterminous assemblages, and to retain each assemblage, at least in idea, separate from the rest. It is not, however, at the point of junction between it and its adjoining groups that I look for the distinctive character. There, as M. Temminck justly observes, it is not to be found. It is at that central point which is most remote from the ideal point of junction on each side, and where the characteristic peculiarities of the groups, gradually unfolding themselves, appear in their full development; it is at that spot, in short, where the typical character is most conspicuous, that I fix my exclusive attention. Upon these typical eminences I plant those banners of distinction, round which corresponding species may congregate as they more or less approach the types of each. In my pursuit of nature, I am accustomed to look upon the great series in which her productions insensibly pass into each other, with similar feelings to those with which I contemplate some of those beautiful pieces of natural scenery, where the grounds swell out in a diversified interchange of valley and elevation. Here, although I can detect no breach in that undulating outline over which the eye delights to glide without interruption, I can still give a separate existence in idea to every elevation before me, and assign it a separate name. It is upon the points of eminence in each that I fix my attention, and it is these points I compare together, regardless, in my divisions, of the lower grounds which imperceptibly meet at the base. Thus also it is that I fix upon the typical eminences that rise most conspicuously above that continued outline in which nature disposes her living groups. These afford me sufficient prominence of character for my ideal divisions; for ideal they must be, where nature shows none. And thus it is that I can conceive my groups to be at once separate and united; separate at their typical elevations, but united at their basal extremes.

“It is difficult to convey, in terms sufficiently explicit, an accurate definition of abstract notions like the present. We may see the subject clearly ourselves, but not be able to communicate it by words sufficiently intelligible, unless to those who may happen to view it in the same light as ourselves. I shall therefore take a familiar illustration, which comes home to the feelings of every man, and where it will be immediately apparent that strongly marked divisional groups may be kept apart from each other in our conceptions, although we can recognise no absolute boundary lines by which we can say they are separated.

“Let us take, for instance, that period of time which in-

Raptores. involves the annual revolution of the earth round the sun, and let us divide it into the usual departments which we call seasons. Every man can picture to his own mind the decided characters by which these divisions of the year are parted from each other; he can mark out by definite distinctions those striking periods where the year bursts forth into bud, where it opens into flower, where it ripens into fruit, and where it lapses into decay. He can ascertain the nature of the impressions which each season forces upon his own feelings, he can communicate such sensations to others, and he can embody those natural periods, of whose separate existence he feels conscious, into separate and well-characterised divisions, to which he can refer, without fear of being misunderstood, under the distinct appellations of spring or summer, of autumn or of winter. But can he at the same time point out the actual limits of these natural departments of the year? Can he fix, for instance, in that intervening interchange of season, where the rigour of winter silently and imperceptibly relaxes into the mildness of spring,—can he fix, I say, upon the exact period when the former terminates, and the latter begins? Can he assert at one moment that he is within the precincts of one season, and that, even while he speaks, he has passed into the confines of the other. He may, it is true, assign artificial limits to each department, and may calculate with mathematical precision the months, the days, the hours, of which it consists. He may even assign reasons for his arbitrary divisions, and prove their probable approximation to the regular interchange of nature. And this is precisely as far as the Zoologist can go. But this is all that is in his power. He never can feel or assert that the character of one season is lost at one particular moment, and gives place to the character of that which succeeds. Here, then, we have four decided divisions, perfectly distinct in themselves, yet to which we are unable to affix the limits. So it is with the groups of Zoology. They exhibit separate divisions, distinguished by separate characters, but running into each other without any assignable limits; and any man may draw his imaginary line across that ‘border country,’ that ‘land debateable,’ which stretches between the conterminous regions, according as it suits his fancy or his peculiar views, or as it may accord with the greater or less preponderance of those minor landmarks which serve as an inferior mode of demarcation in the absence of all natural boundaries.”¹

We shall now proceed with our proposed exposition of the various orders.

ORDER I.—RAPTORES, OR BIRDS OF PREY.²

Raptorial birds, under which term we include the tribes usually known by the general names of vultures, eagles, hawks, buzzards, kites, and owls, are distinguished by a strong, sharp-edged, acutely-pointed bill, more or less curved, but always hooked at the extremity of the upper mandible, which is covered at the base by the membrane called the cere. The nostrils are usually open. The legs, with few exceptions, are plumed as far as the top of the tarsus; the latter part itself is usually bare, but is entirely covered with feathers in most of the nocturnal kinds, and partially so in several of the diurnal. The toes are always four in number, very free in their movements, the outer sometimes versatile; and the whole, with rare exceptions, are furnished with strong, sharp, curved, prehensile claws.

All raptorial birds feed on animal substances,—the majority on living prey. Representing in their own class the

ferine species among quadrupeds, they subdue their weaker brethren by force more frequently than guile; and if not more tyrannical than tigers, they at least exercise a more extended sway, for the fields, the woods, and waters, the barren mountains, and resounding shore, are all alike subjected to their fierce control. Their power of flight is remarkable for its surpassing strength and long endurance. They occur in some form or other under every clime, and their external aspect varies greatly, both in size and shape, from the ponderous eagle and condor of long extended wing, to the finch-falcon of Bengal, which is scarcely larger than a sparrow. But, generally speaking, raptorial birds are of considerable bulk, as might be anticipated from the necessity under which they lie of subduing an active and not always unresisting prey. Their forms, however, are often graceful, their actions energetic, their eyes bold and bright, and their plumage beautifully varied;—but they are more remarkable for chaste and subdued colouring, for sober shades of intermingled black and brown, than for those brilliant or gorgeous hues which characterise so many of the feathered tribes.

Their dispositions naturally fierce or unaccommodating, if not contentious, their ravening appetites, and dangerous weapons, induce them but seldom to associate with each other. We shall not here describe them, after the manner of many authors, as gloomy and mistrustful,—for what cause has an eagle, rejoicing in his strength, and winging his way from distant isles o’er waters glittering with redundant life, or hovering on the side of some majestic mountain, of which the purple heath is one wide storehouse of the best of game,—what cause has he for gloom? Or why should he mistrust, whose sail-broad vans might almost carry him across the vast Atlantic, or assuredly in a few brief hours transport him from his bold but barren eyrie, to richer pastures, reverberating with the varied voices of defenceless flocks? We believe there is nothing mournful or disconsolate in beings which pursue the unfettered exercise of natural instinct. Such fearful attributes are but reflections from the melancholy mind of man (whose morbid *reason* often casts a gloom across the brightest sun), but cloud not in reality the face of nature. Birds of prey, however, are not gregarious,—although, “where the carcass is, there will the eagles be gathered together.” For eagles we presume to read vultures, the scavengers of the raptorial order, which in sultry regions are highly useful in clearing all decaying offal from the earth. With these exceptions, the others may be said to dwell in single pairs,—at times in solitude. They build their rude but sufficing nests amid precipitous rocks, on ancient ruins, and occasionally among forest trees, while a few take up their station on the ground. They seldom lay more than four eggs, and many only rear a pair of young. These are at first extremely helpless, and covered for a time with down. The females, in the generality of species, are considerably larger than the males. The plumage of the sexes often differs greatly, and in such cases the offspring for one or more seasons resembles the mother.

The voice in the raptorial order is almost always harsh and unmusical, sometimes more plaintive in the hooting kinds, complaining by night from ivy-mantled tower or ancient tree; and only one species, a hawk from Africa, has been ever said to sing. The uses to the human race of birds of prey are not remarkable. The scavengers above alluded to are beneficial in their way, but the same can scarcely be alleged of such as carry off our lambs or poultry; and we are not aware that either their flesh or feathers are of much avail. More might have been said of certain members of the order, had not the practice of

¹ *Zoological Journal*, No. ii. p. 196.

² ACCIPITRES, Linn.; RAPACES, Temm.

Raptores. falconry, with other chivalrous uses, been about to pass away.

SECT. I.—DIURNAL BIRDS OF PREY.

Cere usually naked, or partly covered by setaceous feathers. Nostrils open. Eyes of medium size, lateral. Head rather small, and elongated; face not surrounded by a completed disk of projecting feathers, as in owls. Sternum strong and solid. Stomach membranous. Intestines not greatly extended. Cæca short. Toes naked.

Of this section Linnæus and the other naturalists formed only two genera, *Vultur* and *Falco*, which some regard as forming two large families, subdivided into numerous minor groups. There is, upon the whole, a well-marked character, or at least a strong physiognomical distinction, between the *Vulturidæ* and *Falconidæ*; but this is more easily seen than expressed, or, when expressed, is often erroneously so. Thus a strong alleged distinction is the nearly naked head of the former; but the lammer-geyer (*G. barbatus*) has that part as dunsly plumed as any eagle. However, the nails are generally blunt, and the feet comparatively feeble.

FAMILY I.—VULTURIDÆ.¹

The birds of this family are of large size and gluttonous habits. They prefer animal substances in a state of decomposition to living prey, and are frequently gregarious. The bill is never notched, and the feet and claws are more feeble and less curved than among the *Falconidæ*. Though indolent, especially after meal time, they are distinguished by great powers of flight. Their bodies in repose assume a more or less horizontal position. Their flesh is disgusting as an article of food, but their down has been occasionally made use of for domestic purposes.

GENUS VULTUR, Cuv. Bill large and strong, compressed, straight at the base, convex and rounded at the point. Nostrils naked, rounded, obliquely pierced. Head and neck bare of ordinary feathers, but covered by a short down. A collar of long soft feathers at the base of the neck.

The true vultures, as now restricted, belong to the ancient world. Their flight, though slow, is powerful and long sustained. They frequently rise, by repeated gyrations, to a great height in the air, and descend in a similar manner. They assemble in troops, and feed for the most part on carcasses; yet the Dalmatian shepherds are said to dread their inroads among their sheep and lambs. They build among inaccessible rocks, and feed their young by emptying the unsavoury contents of their own crops. It does not appear that they can transfix or carry off their prey by means of their talons, as do hawks and eagles.

We have two species in Europe, the cinereous vulture (*V. cinereus*, Linn. Plate CCCLXXXVIII. fig. 1), called *arrian* on the Pyrenees, and the *griffon* or fulvous vulture (*V. fulvus*, Linn.). Both birds occur in Spain and the Tyrol, but are scarcely ever seen in Switzerland, and are rare in Germany. The nidification of the cinereous vulture is still unknown. It probably never breeds in Europe, but rather in the mountainous countries of Asia, where it is known to occur abundantly. The fulvous vulture is more courageous than the preceding, and more inclined to seize on living prey. It is common in the neighbourhood of Gibraltar, abounds in Dalmatia during winter, and has been observed to breed in Sardinia on lofty trees. It lays two eggs, of a greenish white, with a

rugose surface. It is widely spread over the continent of Africa. Several other species are found in the warmer regions of the old world.

GENUS SARCORAMPHUS, Dumeril.² Bill thick, straight from the base, but strongly curved at the extremity, the margin of the upper mandible having a somewhat sinuous or S-like outline. Nostrils longitudinal and oblong. Head and neck bare, wattled, surmounted by a fleshy crest.

This genus is confined to America, and consists of three species, the famous condor of the Andes (*S. condor*), the king-vulture (*S. papa*), and the Californian vulture (*S. californianus*). The condor inhabits the loftiest of the Andes, and in its aerial flights is supposed to attain to a station far above that of every other living creature. According to Humboldt, it soars to an elevation nearly six times greater than that at which clouds are usually suspended in the sky. At the vast height of almost six perpendicular miles, the condor is seen majestically sailing through the ethereal space, watchfully surveying the airy depth in quest of his accustomed prey. When impelled by hunger, he descends to the nearest plains which border on the Cordilleras; but his sojourn there is brief, as he seems instinctively to prefer the desolate and lofty mountains. The barometer amid such aerial haunts attains only to the height of sixteen inches. These rocky eyries (of which the plain is elevated about 15,000 feet above the level of the sea) are known vernacularly by the name of *condor nests*. There, perched in dreary solitude, on the crests of scattered peaks, at the very verge of the region of perpetual snow, these dark gigantic birds are seen silently reposing like melancholy spectres. Hardly an instance is known of their assailing even an infant, though many credulous travellers have given accounts of their killing young persons of ten or twelve years of age.³

The history of the condor, like that of its Patagonian neighbours of the human race, has in fact been much obscured by exaggeration. An inspection of its feet and claws suffices to show that it is not gifted with great prehensile power, and could scarcely carry off the most ill-conditioned child, though not seldom accused of such evil practices. Condamine informs us that he has often seen condors hovering over flocks of sheep, some of which they "would have carried away, had they not been scared by the shepherds;" and this vague supposition is stated as a *fact* in their natural history! It is a bird of powerful wing, but of vulturine habits, feeding much on dead animal matter, but not unfrequently joining together in the attack of cattle, especially of such as are in any way enfeebled. Although the usual station of the condor is mountainous, it often descends, as we have said, to feed among the plains and valleys; and a female, now in the French museum, was found at sea, sitting on the dead body of a floating whale. It breeds amid the inaccessible peaks of the Andes, making no nest, but depositing its eggs upon the arid rock. It is a large bird, of from three to four feet in length, with an extent of wing variously stated, but probably sometimes reaching from ten to twelve feet. The female is of a much browner hue, and wants the caruncles. She is less in size than the male, an unusual circumstance in this order, although we suspect that the greater bulk of that sex is a feature chiefly characteristic of the hawks and eagles.

"In riding along the plain," says Sir Francis Head, "I passed a dead horse, about which were forty or fifty condors; many of them were gorged and unable to fly; several were standing on the ground devouring the carcass;

¹ On the modern groups into which this family is divisible, the reader may consult a paper by Mr Vigors in the *Zoological Journal*, No. viii. p. 368.

² *Vultur*, Linn. Cuv.; *Cathartes*, Illiger, Temm.

³ Nuttall's *Manual of Ornithology*, i. p. 36.

Raptores. the rest hovering above it. I rode within twenty yards of them; one of the largest of the birds was standing with one foot on the ground, and the other on the horse's body; display of muscular strength as he lifted the flesh, and tore off great pieces, sometimes shaking his head and pulling with his beak, and sometimes pushing with his leg. Got to Mendoza, and went to bed. Wakened by one of my party who arrived; he told me, that seeing the condors hovering in the air, and knowing that several of them would be gorged,¹ he had also ridden up to the dead horse, and that as one of these enormous birds flew about fifty yards off, and was unable to go any farther, he rode up to him; and then, jumping off his horse, seized him by the neck. The contest was extraordinary, and the rencontre unexpected. No two animals can well be imagined less likely to meet than a Cornish miner and a condor, and few could have calculated, a year ago, when the one was hovering high above the snowy pinnacles of the Cordillera, and the other many fathoms beneath the surface of the ground in Cornwall, that they would ever meet to wrestle and 'hug' upon the wide desert plain of Villaviciencia. My companion said he had never had such a battle in his life; that he put his knee upon the bird's breast, and tried with all his strength to twist his neck; but that the condor, objecting to this, struggled violently, and that also, as several others were flying over his head, he expected they would attack him. He said, that at last he succeeded in killing his antagonist, and with great pride he showed me the large feathers from his wings; but when the third horseman came in, he told us he had found the condor in the path, but not quite dead.²

The king-vulture, *S. papa* (Plate CCCLXXXVIII. fig. 3), is a much more gaily adorned species, the fleshy portions of its head and neck being red, orange, and purple. The upper parts of the plumage are of a pale reddish-white or clay colour, the collar at the base of the neck is bluish-gray, the quill-feathers and tail black (the former with paler edgings), and the under parts of the body white. This beautiful bird is found in America, from the 30th degree of north latitude, to about the 32d in the southern hemisphere; that is, it occurs in Mexico, Paraguay, Guiana, Brazil, and Peru; but most abundantly beneath the torrid zone. According to Azara, it makes its nest in hollow trees, and lays two eggs. It is supposed to derive its name from its habit of driving off the common vultures of America, called turkey buzzards, from their prey. The female king-vulture is of somewhat smaller size than the male. The ruff, and all the upper parts of her plumage, are brownish black, and her bill is destitute of caruncles.

GENUS CATHARTES, Illiger. Bill much more slender than in the preceding genera; the upper mandible inflated above the nostrils, encroaching as it were upon the forehead, curved at the point, the margins nearly straight; the under mandible slender, slightly inflated, and obtuse at the terminal portion. Cere extended. Nostrils broad, quadrangular, longitudinal, very open. Head and neck naked, without caruncles. Tongue fleshy, fringed. Tarsi naked, rather feeble; claws short, curved, blunt. Tail-feathers twelve.

This genus, as now restricted, is likewise confined to America. It consists of two species, the common turkey buzzard (so called in the United States), *C. aura*, Plate CCCLXXXVIII. fig. 2, and the carrion-crow (of the same country), *C. atratus*. The former is abundant both in North

and South America, and extends, in the central districts of the fur-countries, as far north as the 54th degree. It is partially migratory, even in the middle states, retiring southwards on the approach of winter. A few remain throughout the year in Maryland, Delaware, and New Jersey; but none are known to breed in any of the Atlantic States to the north of the one last named. In the interior, however, they reach a much higher latitude during their summer migrations, probably owing to the greater heat of that season in the inland districts. A few make their appearance on the banks of the Saskatchewan when the month of June is far advanced, and after all the other summer birds have arrived and settled in their leafy arbours. Though gregarious in more southern countries, where they fly and feed in flocks, towards their northern limits seldom more than a pair are seen together. They feed on carrion, which they discover at a great distance, it is now said, by the sense of sight alone. They sometimes eat with such gluttonous voracity as to be unable to rise from the ground. They have been accused of attacking pigs, beginning the assault by picking out their eyes. But Mr Waterton, during his residence in Demerara, could not ascertain that they destroyed even living reptiles. He killed lizards and frogs and placed them in their way, but they took no notice of them till they began to emit a putrid effluvia. He differs from Mr Audubon in his ideas regarding the relative superiority in these birds of the organs of sight and smell. The one thinks the eyes have it, the other the nose. The turkey buzzard hatches her eggs in some swampy solitude, on a truncated hollow tree or excavated stump or log, laying them on the rotten wood. This species roosts at night on trees, but more seldom than the other kind in flocks. In winter they sometimes pass the night in numbers on the roofs of houses in the suburbs of the southern cities, probably induced to do so by the warmth which emanates from the chimneys. On fine clear days, even in the winter season, they amuse themselves by soaring majestically into the air, rising rapidly in large gyrations; and ascending beyond the thinnest fleecy clouds, they almost disappear from mortal view. In South America they will sometimes accompany the condor in his loftiest flights, rising, all fetid though they be, above the region of the purest Alps; and thus exhibiting an emblem of the mind of man, so often sunk in Epicurus' sty, yet for a time so raised by god-like genius, as not seldom to perceive "far off the crystal battlements of heaven."

The other species of this genus is the black vulture, or carrion-crow of the United States, *C. atratus*. It is rather less than the preceding, measuring about twenty-six inches in length, the general colour of the plumage dull black, with a dark cream-coloured spot on the primaries. It is more impatient of cold, and prevails chiefly about the larger maritime cities of South Carolina, Georgia, and Florida. They seem, from Mr Douglas's account, to proceed further north on the western side of the Rocky Mountains. Although they rise at times to a considerable elevation, their flight is less easy and graceful than that of the turkey buzzard. They are much more familiar, and in Charleston and Savannah may be seen walking the streets as demurely as domestic fowl. They sometimes become individually known; and a veteran with only one leg was observed to visit the shambles, and claim the bounty of a gentle butcher, for upwards of twenty years.

¹ "The manner in which the Guachos catch these birds is to kill a horse and skin him; and they say that although not a condor is to be seen, the smell instantly attracts them. When I was at one of the mines in Chili, I idly mentioned to a person that I should like to have a condor: some days afterwards a Guacho arrived at Santiago from this person with three large ones. They had all been caught in this manner, and had been hung over a horse; two had died of galloping, but the other was alive. I gave the Guacho a dollar, who immediately left me to consider what I could do with three such enormous birds."

² *Rough Notes across the Pampas.*

Raptores.

GENUS NEOPHRON, Sav. *Cathartes*, Illig. *Pernopterus*, Cuv. Bill long, slender, rounded, inflated at the curvature of the upper mandible, which is much hooked at the extremity. Nostrils median, oval, longitudinal, open. Cere covering two thirds of the bill. Face, cheeks, and throat naked, also a space extending down the middle of the neck. Tongue oblong, linear. Tail of fourteen feathers.

These birds are inhabitants of the ancient world. They are less powerful than the true vultures, and of smaller size, but are still more useful in their scavengerial functions, their love of putrid flesh, and of all impurities, being insatiable. The rachanach of Bruce, or gingi vulture of Sonnerat (*Neophron pernopterus*, Sav.), affords a characteristic example. See Plate CCCLXXXVIII. fig. 4. It is equal in size to a raven, the throat and cheeks naked, the feathers of the head and back of the neck long, narrow, and pointed. The plumage of the male is white, except the quill-feathers, which are black; that of the female and young is brown. This species has been described under a great variety of names. It occurs in several parts of Europe, more especially in Spain, Italy, and the Island of Elba. It is likewise widely distributed over Africa, where it is known to the Hottentots by the name of hougoop. It was held in great respect by the ancient Egyptians, and is frequently represented on the monuments of that mysterious people. It is said to follow caravans through the desert, for the sake of devouring every dead or unclean thing. We may add, that it has occurred once or twice in England.

GENUS GYPAETOS, Storr. Bill strong, straight, curved at the point, and somewhat inflated at the curvature. Cere basal, covered by strong bristly feathers pointing forwards. Nostrils oblique, oval, concealed by bristles. Tongue thick, fleshy, bifid. Head feathered. A tuft of bristly or hair-like feathers beneath the bill. Tarsi short, thick, feathered. Tail-feathers twelve.

This genus contains only a single species, the celebrated lammer-geyer, or bearded vulture of the Alps (*G. barbatus*). See Plate CCCLXXXVIII. fig. 5. It is one of the largest, or at least the longest-winged, of all the European birds of prey, haunting the highest mountains, and preying on lambs, goats, chamois, marmots, &c. Its strength and prowess are probably exaggerated, for although its powers of wing are undoubtedly great, its legs and talons are proportionally more feeble than those of eagles and falcons. It is said not unfrequently to secure its alpine prey by descending upon it suddenly with rushing wing, and driving it over a precipice, devouring the shattered limbs at leisure. It builds among inaccessible precipices, and lays two eggs. It is now one of the rarest of the birds of Europe, though formerly not uncommon among the mountains of Tyrol, Switzerland, and Germany. The peasant sportsmen of the last century often killed them, and one, Andreas Durner by name, is quoted by M. Michahelles as having shot sixty-five with his own hand. Though a bird of rare occurrence, the bearded vulture is very extensively distributed. In Europe it haunts the steep slopes of the Pyrenean Mountains, and the central Alps from Piedmont to Dalmatia; it is described by MM. Larey and Savigny as occurring in Egypt, and by Bruce as an inhabitant of Abyssinia; it has been received both from Northern Africa and the Cape of Good Hope, by M. Temminck; in Asia it is known to cast its cloud-like shadow over the vast steppes of the Siberian deserts; while not many years have elapsed since Professor Jameson re-

ceived it from the snow-capped ranges of the Himalaya Mountains. Raptores.

The bird described by Bruce under the title of *About Duck'n*, or Father Long-Beard, is certainly identical with the lammer-geyer, although we have been sometimes puzzled to reconcile the comparatively feeble feet of the beautiful series submitted to our examination by Professor Jameson, with the meat-bearing prowess of the Abyssinian instance. On the loftiest summit of the mountain of Lamallon, while the traveller's servants were refreshing themselves after the fatigues of a toilsome ascent, and enjoying the pleasures of a delightful climate and a good dinner of goat's flesh, a lammer-geyer suddenly made his appearance among them. A great shout, or rather cry of distress, attracted the attention of Bruce, who, while walking towards the bird, saw it deliberately put its foot into a pan containing a huge piece of meat prepared for boiling. Finding the temperature, however, somewhat higher than it was accustomed to among the pure gushing springs of that rocky and romantic region, it suddenly withdrew, but immediately afterwards settled upon two large pieces which lay upon a wooden platter, and transfixing them with its talons, carried them off. It then disappeared over the edge of a "steep Tarpeian rock," down which criminals were sometimes thrown, and whose mangled remains may be supposed to have first induced the bird to select the spot as a place of sojourn. The traveller, in expectation of another visit, immediately prepared his arms, and it was not long before the gigantic creature re-appeared.

As when a vulture on Imaus bred,
Whose snowy ridge the roving Tartar bounds,
Dislodging from a region scarce of prey,
To gorge the flesh of lambs or yearling kids
On hills where flocks are fed, flies towards the springs
Of Ganges or Hydaspes, Indian streams;
But on his way lights on the barren plains
Of Sericana, where Chinese drive
With sails and wind their cany waggons light :—

So landed with far-stretched fanning pinions our lammer-geyer, within ten yards of his expected savoury mess, but also within an equal distance of Bruce's practised rifle, which instantly sent a ball through its ponderous body, and the magnificent bird sunk down upon the grass, with scarce a flutter of its outspread wings.

We may here close our brief notice of the first great family of the raptorial order, merely remarking farther, that the species last alluded to, though not so regarded by any of our systematic writers, appears to us to bear a great resemblance to the kites.

FAMILY II.—FALCONIDÆ.

This extensive family corresponds to the ancient unrestricted genus *Falco*, now greatly subdivided by modern naturalists, but not yet very satisfactorily arranged.¹ It contains a vast assemblage of eagles, hawks, buzzards, kites, &c., all characterized by a more or less curved bill, of which the upper mandible is strongly hooked; by obvious or open nostrils, pierced in an almost always naked cere; and by curved retractile pointed talons. The head is never bare of feathers, as in most of the preceding family, and the eye-brows are usually bony and projecting.

The geographical distribution of the Falconidæ, considered in their generality, is universal, one or more species being found in all known countries from Spitzbergen to

¹ The genus *Falco*, which in the days of Linnæus did not exceed thirty-two different kinds, amounts, in the last edition of Dr Latham's *Synopsis*, to 247. We have no doubt it now exceeds 300 species, even although many of Latham's names are reducible to the rank of synonyms.

Raptores. New Holland, and several particular kinds having a very wide range, not only longitudinally across the whole temperate and northern parts of Europe, Asia, Africa, and America, but latitudinally through almost every clime. Most of them are, to a certain extent, migratory in their habits, although their movements are by no means so regularly periodical as are those of more laborious wing. In fact, the birds of this family, surpassing all others both in the duration and rapidity of their flight, are scarcely amenable to those natural laws which, in so many instances, appear to regulate or restrict the location of other tribes; and hence we find, that if a mural precipice, an insulated crag, the mouldering wall of a ruined castle, or the tortuous branch of some ancient and umbrageous forest tree, has been successfully sought for in spring as a secure retreat for the purposes of nidification and the rearing of their young, the other seasons of the year are usually spent in a life of wandering rapine. When we consider the facts which have been recorded of the flight both of hawks and pigeons, the migratory movements of birds in general become much less a subject of wonder (excepting always the beautiful instinct by which they are directed), than they would at first appear. It is well known that a falcon belonging to Henry II. of France, which had been carried to Fontainebleau, made its escape, and was retaken *next day* in the island of Malta, where it was recognised by the rings on its legs. According to Colonel Montagu, it must have flown with a velocity equal to fifty-seven miles an hour, supposing it to have been on wing the whole time. "But as such birds never fly by night, and allowing the day to have been at the longest, or containing eighteen hours of light, this would make seventy-five miles an hour. It is probable, however, that it neither had so many hours of light in the twenty-four to perform the journey, nor that it was retaken the moment of its arrival; so that we may fairly conclude that much less time was occupied in performing that distant flight." Another falcon having been sent from the Canary Islands to the Duke of Lermos, then in Andalusia, was found in Tenerife *sixteen hours* after it had taken its flight from Spain. In regard to this instance the calculation is more simple, and less likely to prove erroneous, because, supposing the bird to have followed anything like a direct course, its flight from the coast of Andalusia to its native island would lie throughout over the waters of the ocean, and must therefore have been *continuous*. Now the distance being not less than 752 miles, that space divided by sixteen, the number of hours employed would give an average of forty-seven miles an hour for the whole course. At this rate, if a falcon were to leave the rock of Gibraltar on a Monday morning, it might enjoy eight hours repose, and yet reach Edinburgh Castle in the course of Tuesday forenoon. Pigeons have been shot in the far-inland forests of America with their stomachs full of fresh rice, which, to have resisted the digestive process, must have been swallowed *not many hours* preceding, but could not have been obtained within *eight hundred miles* of the place where they were killed.¹ It thus appears probable, that the most extended migratory movement which any species is required to perform, may in the greater number of cases be accomplished in a couple of days,—more frequently in the course of a few hours.

The numerous species by which this great family is constituted, though rarely adorned by those brilliant colours which characterize so many of the gentler tribes, are perhaps of all the feathered race the most remarkable for beauty of form and elegance of proportion. Their eyes

are usually large and lustrous; their limbs, even when light, very strong and muscular, and armed with formidable claws with which they *pounce* their prey. Their general aspect (especially that of the true falcons), when compared with other birds, is well expressed by the word *noble*; and a single glance suffices to show that a combination of fierceness, energy, and courage, must form their predominating character. Like most other animals, however, whether human or brute, they are by no means insensible to kindness; and their instinctive sagacity, when directed by the skill and perseverance of man, has for ages been rendered subservient to his amusement in the sports of the field. But the princely art of falconry, whether from the progress of agriculture, the consequent minuter subdivision of land, and the increase of inconvenient barriers by the fencing of enclosed grounds,—or the tastes of men of rank and fortune having followed in another direction, has now almost entirely fallen into disuse. The species most generally trained for the purpose in this country appears to have been the peregrine falcon, but many other kinds are used in eastern regions; and even ponderous eagles are sometimes made subservient to the human will. Few things indeed more strongly illustrate the subduing influence of reason over instinct, than that a coarse illiterate groom, by tossing up a shapeless lure, should thus entice a proud rejoicing falcon from his airy height, and render him so submissively obedient as to forsake his soaring flight, and all his bright survey of field and river, and close contentedly his yet unwearied wings, to perch for hours upon a brawny arm, his lustrous eye encapped in velvet hood, and limbs "by jessies bound."

We must be very brief in our indications of the minor groups; and of several subgenera, as they are called, we can do nothing more than give the names. We do not here adopt the division of noble and ignoble birds of prey, which we deem a distinction without a difference, seeing that some of the long-winged hawks are difficult to train, while several of the short-winged kinds are made with ease submissive to the human race.

The genus *DAPTRIS* of Vieillot (*Caracara*, Cuv.) is formed by the *Falco aterrimus* of Temm. (*Pl. Col.* 37 and 342). The cheeks and front of the throat are bare of feathers. The cere is haired. The adult plumage of the species named is black, with a white band spotted with black at the base of the tail; the bare portion of the face is flesh-coloured, the cere and legs yellow, the bill lead-coloured. The total length is about fifteen inches. It occurs in Guiana and Brazil. Its habits are unknown.

The genus *LYCTER* of the same author (*Caracara*, Cuv.) has the cere smooth, and the upper part of the neck, as well as the cheeks, bare of feathers. The stomach is also bare and prominent. The tarsi are short, strong, and reticulated. We believe there is only a single species of this genus also, the *Ib. leucogaster* of Vieillot (*Gal.* pl. 6), or *Falco formosus* of Latham. Its bill is feeble, and but slightly hooked, and its habits offer a corresponding non-conformity with the usual manners of the raptorial order. It is of a mild and peaceable nature, living, it is said, chiefly on fruits and seeds, with the addition of a few insects, such as ants and locusts. It builds on trees, and utters from time to time a harsh discordant cry. It inhabits Guiana and Brazil, and, exhibiting some of the habits of the toucans, is called by the negroes the *capitaine des gros becs*.

The genus *CARACARA*, Cuv. (*Polyborus*, Vieil.), has the face only partially naked. The *C. Braziliensis* (Plate CCCLXXXVIII. fig. 6) is extremely common in Paraguay.

¹ Geese are also known to have been shot in Newfoundland with their crops full of maize, a species of corn which does not grow but at an immense distance from that island.

Raptores. It lives in pairs, flies rapidly, and preys on birds and small quadrupeds, as well as on insects and reptiles. The female is said to build upon the ground when in the pampas, and on trees when located in wooded countries. This accommodating habit is known to prevail among many other birds.

The three preceding genera, which some regard as forming the tribe of *Caracaras*, are all native to the new world, and may be said to form a link with the vultures, both in regard to the bareness of the face, and their alleged tendency to prey on carrion.

We now proceed to the tribe of *eagles*, of which the bill is very robust, comparatively straight at its basal and middle portion, and suddenly curved at the extremity. It includes the species most celebrated for their strength and courage. Their strong limbs, curved talons, and broad expansive wings, enable them to carry off well-grown lambs, and other bulky prey. They are therefore dreaded by shepherds and such pastoral people, as robbers of the first rank, and a high premium is placed upon their heads accordingly.

In the genus *AQUILA* properly so called, the bill is shorter than the head, straight, curved at the tip, the edge of the upper mandible with a slight festoon; the nostrils are oblong and oblique; the cere haired; the tarsi short, and covered with feathers. The well-known golden eagle (*A. chrysaetos*) affords a characteristic example. This fine British species is widely spread over Europe and America. In our own country it builds on the ledges of mountain precipices—on the Continent its nest is frequently found in forests; for example, in that of Fontainebleau. It is common in the northern and central parts of Europe, but rarer in the south. It is, however well known in Italy. We have seen it sailing over the deep basin of the vale of D'Uomo d'Ossola, and high above the highest snowy peaks which glitter around the majestic passes of the Simplon. In America it breeds among the subalpine districts which skirt the Rocky Mountains, being seldom seen farther eastward. It is regarded by the aborigines as an emblem of strength and courage, and the Indian warrior as well as the highland chieftain glories in his eagle plume. These birds sometimes soar to a vast height, but they seem to do so rather as a kind of sporting exercise, than with a view to search for prey. When employed in hunting, they keep far nearer the earth, sweeping up the valleys, and skirting the sides of heath-covered mountains. The golden eagle is becoming rarer in Scotland every year. Many ancient eyries are pointed out to travellers by gray-haired shepherds, where the bird itself is now no longer known, and in no lengthened period we may expect its extirpation. Several other kinds of feather-footed eagles are known to naturalists, such as the *Aquila imperialis*, a common Egyptian species, not unfrequent in the eastern countries of Europe,—and the *Aquila Bonelli*, a recent acquisition, native to the mountains of Sardinia, and no doubt inhabiting other alpine lands. *Aquila fucosus* is a New Holland species, very common near Port Jackson, and remarkable for its fine wedge-shaped tail.

In the genus *HALIÆTUS*, or sea-eagle, the bill is nearly as long as the head, and the tarsi are bare of feathers, except at the top. Their habits resemble those of the eagles proper, but they prey more on fish, and will feed more readily on tainted flesh. Species occur in Europe, Asia, Africa, America, and Australia. Our own white-tailed eagle (*H. albicilla*, Plate CCCLXXXVIII. fig. 8) affords a good example. "On observing a person walking near their nests,"

says Mr Macgillivray, "they fly around him at a respectful distance, sailing with outstretched wings, occasionally uttering a savage scream of anger, and allowing their legs to dangle, with outspread talons, as if to intimidate him. I have observed them thus occupied, when on the edge of a precipice five hundred feet high, with a very steep slope above me, bounded by rocks, and from which I could not have made my escape had the birds been resolute. Although on such occasions they are in general extremely cautious, notwithstanding their manifest anxiety for the safety of their young, yet I once saw an eagle come within an hundred yards, when it was brought down with buckshot by a friend whom I had accompanied to the place."¹ The same writer observes, that he has never heard of the sea-eagle attacking those employed in robbing its nest; but that he has been credibly informed of its having attempted to molest individuals whom it chanced to find among its native crags, in perilous places. In the Hebrides it is itself frequently assailed by the skua-gull; and we have ourselves more than once seen it attacked by the raven.

In our present group are many other species, such as the beautiful *Haliæetus leucogaster* of New Holland, and the bald or white-headed eagle of America, *H. leucocephalus*. The latter is often seen sailing through and around the gigantic column of spray which rises from that "hell of waters," the cataract of Niagara. Though a bird of powerful wing, he seems to have fallen somehow into lazy habits, or at least prefers the produce of others' labours to his own. "Elevated," says Wilson, "on the high, dead limb of some gigantic tree, that commands a view of the neighbouring shore and ocean, he seems calmly to contemplate the motions of the various feathered tribes that pursue their busy avocations below,—the snow-white gulls slowly winnowing the air,—the busy tringæ coursing along the sands,—trains of ducks streaming over the surface,—silent and watchful cranes intent and wading,—clamorous crows,—and all the winged multitudes that subsist by the bounty of this vast liquid magazine of nature. High over all these hovers one whose action instantly arrests his whole attention. By his wide curvature of wing, and sudden suspension in air, he knows him to be the fish-hawk, settling over some devoted victim of the deep. His eye kindles at the sight, and balancing himself with half-opened wings upon the branch, he watches the result. Down rapid as an arrow from heaven descends the object of his attention, the roar of its wings reaching the ear as it disappears in the deep, making the surges foam around. At this moment the eager looks of the eagle are all ardour; and levelling his neck for flight, he sees the fish-hawk once more emerge, struggling with his prey, and mounting in the air with screams of exultation. These are the signals for our hero, who, launching into the air, instantly gives chase, and soon gains on the fish-hawk; each exerts his utmost to mount above the other, displaying in these rencontres the most elegant and sublime aerial evolutions. The unencumbered eagle rapidly advances, and is just on the point of reaching his opponent, when with a sudden scream, probably of despair and honest execration, the latter drops his fish:—the eagle poising himself for a moment, as if to take a more certain aim, descends like a whirlwind, snatches it in its grasp ere it reaches the water, and bears his ill-gotten booty silently away into the woods."² When forced to hunt for themselves, they often attack young pigs, lambs, and sickly sheep.

In the genus *PANDION* the bill is much shorter than the head; the tarsi are short and naked, covered all round with

¹ *Rapacious Birds of Britain*, p. 60.

² *American Ornithology*, vol. i. p. 23. We quote Professor Jameson's *systematic edition*, in four small volumes (Constable's *Miscellany*, 1831). The student of American Ornithology will find some valuable notes by Sir William Jardine, in another Edinburgh edition, in three vols. large 8vo, 1832.

Raptores. imbricated scales; the claws are large and rounded on the under surface, the outer toe very versatile; and the second feather of the wing the longest. Our British osprey, or small fishing eagle, is the *Pandion haliaetus*. It breeds in the vicinity of many of our northern sea-lochs, often on the chimney-top of ruined castles by the shore. It destroys a vast quantity of fish, which it secures by thrusting its talons through their backs during a sudden momentary plunge beneath the waves. It is remarkably abundant in North America; and Wilson observes that it permits the purple grackles to build their nests amid the interstices of the sticks of which it has framed its own. He adds, that it never picks up any fish which it may chance to drop either on land or water. We know not if this trait applies to those of the "old country." We once saw an osprey drop a large sea-trout, which it certainly did not attempt to recover; but then there happened at the same time to be an excellent shot, with a double barrel, within a rather dangerous distance of the same. The osprey occurs in New Holland, and is elsewhere very widely spread.

The genus *Circætus* of Vieillot is in a manner intermediate between the fishing eagles, the ospreys, and the buzzards. We may mention as an example the bird called *jean-le-blanc* by the French (*F. Gallicus*, Gmelin), a common continental species.

In *Harpia*, Cuv. the bill is very strong, and compressed, the upper mandible dilated on the margins, and much hooked. The head is crested, the tarsi thick, the wings rather short. The harpies are large birds of prey, which dwell chiefly in the forests of Guiana, making their nests on trees, and committing great depredations. The largest is the *H. destructor* of Daudin (Plate CCCLXXXVIII. fig. 7), said to be capable of cleaving a man's skull by a single blow of its beak. We doubt if any one ever tried. However, it carries off young fawns, and sloths of a year old. It is a rare bird, lately imported to the Zoological Gardens of London, and well exemplified by the specimen in the Edinburgh Museum.

In the genus *Morphnus* of Cuv. (*Spizætus*, Vieillot), the wings are shorter than the tail, the tarsi are lengthened (in some feathered), and the toes feeble. The species are extremely beautiful, and richly varied in their markings. They are chiefly found in South America. We have figured as an example (see Plate CCCLXXXVIII. fig. 9) the *Morphnus cristatus* (*F. Guianensis*, Daud.), which strongly resembles the great harpy just mentioned in its general aspect, but is at once distinguished by its smaller size and longer tarsi. We may mention as an instance of those with plumed tarsi, the *Falco cristatellus* of Temm. *Pl. Col.* 282, which is a native of India and Ceylon.

In *Cymindis*, Cuv. and Temm. the tip of the upper mandible forms a lengthened curve, with a very acute point. The nostrils are obliquely cleft, almost closed; the cere narrow. The tarsi are very short, and reticulated; the wings rather long. The species are South American, and we know of nothing remarkable in their habits. See *Cymindis uncinatus*, Illiger, *Pl. Col.* 103. The extremely hook-billed species (*C. hamatus*, *Pl. Col.* 61) now forms the genus *ROSTRHAMUS*. Its nostrils are rounded, the space before the eye is bare, and the tarsi are scutellated. Its habits are unknown.

Naturalists differ greatly in their distribution of the preceding genera. Mr Swainson thinks *Circætus* is a sub-generic form of *Gypogeryon*, and he places *Cymindis* with the Caracaras, and certain other groups, in his sub-family *Cymindinæ* or kites, and locates *Morphnus* (*Spizætus*, Vieil.) with the buzzards.

We now proceed to a *third tribe*, consisting chiefly of

the sparrow-hawks and goshawks. The bill is curved almost from the base, convex, the upper mandible dilated on the sides, the lower short and obtuse. The nostrils are nearly oval; the tarsi rather long and slender; the claws broad and sharp. The wings have the fourth feather the most extended, and are shorter than the tail. The species are numerous, and occur in all parts of the globe. The larger, which are also proportionally the more robust, with thicker tarsi and shorter wings, have by many Ornithologists been considered as constituting a separate genus, to which the name of *ASTUR* is applied. That rare British bird the goshawk (*Astur palumbarius*) may be named as a good example, while the smaller and more slender kinds included in the genus *Nisus* are represented by our sparrow-hawk (*N. communis*, the *Falco nisus* of Linn.). The transition from one to the other is however very gradual, and some deem their separation unwarrantable. Even the two British species, though usually regarded as the types of their respective sections, do not differ so much as to render the propriety of their separation very apparent, even were no other species known. They are all extremely active, as daring as the true falcons, and prey exclusively on living objects, which they seize with admirable dexterity. Their flight is generally low, and as they pass over the fields or woods, they dart upon their prey, whether it be in the air, among branches, or crouched upon the ground.¹ The goshawk, though a short-winged species, was formerly held in great estimation for the purposes of falconry. It is one of the most generally diffused of all the accipitrine birds, but is now very rare in Britain. A beautiful white species (*Astur albus*) is found in New Holland. Of the sparrow-hawks we shall allude merely to the *Nisus musicus* of Africa, commonly called the chanting falcon. It is the only raptorial bird in any way gifted with the powers of song; but we must not suppose that its notes at all resemble the harmonious tones of the nightingale, or those of even our less accomplished songsters. Its voice is merely a little clearer than usual, although it seems impressed with a high idea of its own powers, and will sit for half a day perched upon the summit of a tall tree, uttering its incessant cry.

A *fourth tribe* contains the *kites*, which are likewise subdivided into several minor groups, all agreeing in their comparatively feeble bills and feet, their short tarsi, and long extended wings. The tail is forked. They are gifted with great powers of flight, but are neither strong nor courageous, seldom pounce on heavy game, sometimes contrive to prey on fish, and have never the slightest objection to chickens.

In the genus *MILVUS* of Cuv. is included our common kite (*M. regalis*, Vieil.; *Falco milvus*, Linn.). The tarsi are scutellated in front, and tolerably strong. This beautiful bird is rare in many districts of Scotland, and is scarcely ever seen in the Lothians. We have received it from Argyllshire, but do not think it occurs in the Western Isles. We have often, in the North of England, admired its wheeling flight, circling through the air with no perceptible motion of its long expanded wings, and sailing over that enchanting land of lakes and mountains, with such majestic sweeps as if it were itself "sole king of rocky Cumberland." The kite is distributed over all Europe, but is unknown in America. Other species of the genus occur in Asia, Africa, and New Holland.

In the genus *ELANUS* of Savigny the tarsi are very short, reticulated, and half clothed with feathers. The wings are long, the tail but slightly forked. It contains *F. dispar* and *melanapterus*, two species which some regard as one and the same. They feed on small birds, insects, and reptiles, and occasionally devour dead animals.

¹ *Rapacious Birds*, p. 231.

Raptores. If identical, the species must exist in America, Africa (occasionally in Europe), and the East Indies. The swallow-tailed kite (*M. furcatus*) forms the genus **NAUCLERUS** of Vigors. See Plate CCCLXXXIX. fig. 1. The form is slender, the tail very long and greatly forked. The species just named is white, with back, wings, and tail black, glossed with green and purple. It inhabits America, at least as far south as Buenos Ayres, and also passes the summer and breeds in the warmer parts of the United States. Tempted by the abundance of the fruitful valley of the Mississippi, a few are seen to wander as far as the Falls of St Antony, in the forty-fourth degree. Audubon states, that in calm warm weather they soar to an immense height, pursuing the large insects (probably libellulæ) called musquito hawks, using their tails with an elegance peculiar to themselves, and performing the most singular evolutions. The Mississippi kite (*P. plumbeus*, Latham) constitutes the genus **ICTINIA** of the modern systems. It is of a blackish ash colour, the head and under parts of a much paler ashy hue. Wilson frequently observed this hawk in the course of his perambulations, sailing about in easy circles, at a considerable height in the air, and generally in company with Turkey buzzards, with whose mode of flight its own exactly corresponds. It is not easy to say why two birds, whose food and manners are in other respects so different, should so frequently associate in their airy gambols. Though the Mississippi kite feeds chiefly on reptiles and insects, it is a bold and energetic bird. The specimen obtained by Wilson, though wounded, and precipitated from a stunning height, exhibited great strength, and a most unconquerable spirit. He no sooner approached to pick it up, than the bird immediately gave battle, striking rapidly with its claws, wheeling round and round as it lay, "partly on his rump," and defending itself with vigilance and dexterity. Notwithstanding all the aggressor's caution, it struck its hind claw into his hand, with such force as to penetrate into the bone. "Anxious to preserve his life, I endeavoured gently to disengage it; but this made him only contract it the more powerfully, causing such pain that I had no other alternative but that of cutting the sinew of his heel with my penknife." The whole time he lived with Wilson he seemed to watch his every movement, erecting the feathers of his head, eyeing him with fierceness, and no doubt regarding him (and with some show of justice) as the greater savage of the two.

In a *fifth tribe* we may place the honey-hawks, buzzards, and harriers, small groups connected, in a variety of ways, by the usual interplacements, with several of the preceding tribes. The buzzards, for example, both in form and plumage, resemble small eagles, though their bills are more curved from the base;¹ the harriers in some measure connect the buzzards with the accipitrine hawks (gen. *Nisus* and *Astur*); while the honey-hawks (*Pernis*) unite the buzzards to the kites. The natural affinities of groups are in truth so multiplied and complex, that we need scarcely wonder that even those who have most devoted themselves to explore such Cretan labyrinths, should have often failed in their supposed elucidation:—so much the worse for those who have never found the thread.

In the genus **PERNIS**, Cuv. the lore, or space between the bill and eye, is closely covered by small, compact, rounded feathers, the nostrils are narrow, and the tarsi short, stout, and reticulated. The British bee-hawk (*P. apivorus*), or honey-buzzard as it is usually called, though it cares less for the honey than for those that make it, is of this genus. We have no other indigenous, or indeed

European species; but a beautiful crested-kind (*P. cristata*, Cuv.), Plate CCCLXXXIX. fig. 2, occurs in Java and the East Indies. *P. Elliotti* is also native to the latter country.

In the genus **BUTEO**, Bechstein, the cutting margin of the upper mandible is more flexuous or tooth-like, the gape wider, and the space between the eye and the cere is covered by the same setaceous plumage which usually prevails in that part, the nostrils are rounded, and the tarsi scutellated in front. The buzzards are a numerous genus, distributed over most parts of the world. We have only two British species, the common buzzard (*Buteo vulgaris*), and the rough-legged kind (*B. lagopus*). The latter is a rare or rather accidental visitor, its proper districts being the northern parts of Europe and America. We think buzzards are most abundant in wooded countries. They fly more sluggishly than hawks, and generally rather low, but at times they ascend to a great height, sweeping round in easy circles, and uttering a frequent shrilly cry.

In the genus **CIRCUS** the bill is slender and compressed, the cere large, the cheeks encircled by a kind of recurved ruff, and the tarsi long, slender, and scutellated before and behind. We have three British species, the moor harrier (*C. æruginosus*), the common ringtail or hen-harrier (*C. cyaneus*, male,—*C. pygargus*, female), and Montagu's harrier (*C. cineraceus*). All these birds roost and breed upon the ground, fly low, and frequent mountainous or marshy places. They prey upon whatever small-sized creatures they can master, whether beast, bird, reptile, or insect. The hen-harrier is supposed to occur in almost all parts of the world, but the identity of the American and European specimens has not been definitely determined. We have figured a foreign species as an example in Plate CCCLXXXIX. fig. 5. It is the *Circus palustris* of Temminck (*C. superciliosus* of some other authors), and a native of Brazil.

We now arrive at the falcons properly so called, or those which have been sometimes distinguished by the appellation of *noble birds of prey*, probably on account of certain members of the group, such as the peregrine and jer-falcon, being held in high esteem as accessaries in the sports of the field. We cannot say that we have been led to our present arrangement by an impression that it is more natural than any other, for we have already left the point which would have conducted us more insensibly into the ensuing nocturnal group of owls; but we do not think it is liable to more grave objections than are many others. Indeed the circular or recurrent nature of the actual affinities of natural groups renders their true exposition, so far as any consecutive system is concerned, impossible; for, instead of advancing, we must necessarily terminate where we began, and therefore either retrace a portion of our circle, or break or bend it, before we can proceed to another. Without, therefore, desiring the reader to suppose that the harriers in any special way conduct him to the falcons, we shall give a brief notice of the latter.

The falcons are chiefly distinguished by the strong, tooth-like notching of the bill, which in the preceding groups is either entirely absent, or shows itself only in the form of a more or less distinct festoon.² The first quill-feather is always long, the second longer than the third and fourth, so that the wing acquires a sharp or pointed form, instead of the rounded outline of the so-called ignoble tribes; and the points of the wings, when closed, usually attain to the end of the tail.

¹ Mr Macgillivray mentions, that the digestive organs of the common buzzard so greatly resemble those of the golden eagle, that a figure of the one might serve for that of the other.

² It is, we believe, in vain that naturalists attempt exceptionless precision in their generalities; for, in this very group, the jer-falcon, in one sense the *noblest* of all, frequently wants the tooth, and exhibits a bill festooned like the eagle's.

Raptores. In the restricted genus *FALCO*, then, the bill is short, but strong, conical, curved from the base, sharply hooked at the extremity, and almost always toothed as well as pointed; the nostrils are rounded, the cere bare, or merely encroached upon by the bristly feathers of the lore. The tarsi are rather short and strong, and covered with scales of somewhat variable form, but usually rounded or angular. The wings are long and pointed. We have four well-known British species, the peregrine falcon (*F. peregrinus*), the hobby (*F. subbuteo*), the merlin (*F. aesalon*), and the kestrel (*F. tinnunculus*). Besides these, we may name the jer-falcon (*F. islandicus*, Plate CCCLXXXIX. fig. 4) as an occasional, and the orange-legged hobby (*F. vespertinus*) as an accidental visitor. The jer-falcon, in spite of its alleged want of teeth, is one of the boldest and most powerful of the class. This fine species seems now confined almost entirely to the most northern parts of Europe and America. It is well known in Iceland and Greenland, and was often seen by Dr Richardson during his journeys over the "barren grounds" of North America, where it preys habitually on ptarmigan, not, however, despising plovers, ducks, and geese. "In the middle of June," he observes, "a pair of these birds attacked me as I was climbing in the vicinity of their nest, which was built on a lofty precipice on the borders of Point Lake, in latitude $65\frac{1}{2}^{\circ}$. They flew in circles, uttering loud and harsh screams, and alternately stooping with such velocity that their motion through the air produced a loud rushing noise; they struck their claws within an inch or two of my head. I endeavoured, by keeping the barrel of my gun close to my cheek, and suddenly elevating its muzzle when they were in the act of striking, to ascertain whether they had the power of instantaneously changing the direction of their rapid course, and found that they invariably rose above the obstacle with the quickness of thought, showing equal acuteness of vision and power of motion. Although their flight was much more rapid, they bore considerable resemblance to the snowy owl." Upon the whole, we think that Great Britain and Ireland are just as well quit of such a fierce intruder. The Doctor adds, that when the jer-falcon pounces down upon a flock of ptarmigan, the latter endeavour to save themselves by diving instantly into the loose snow, and making their way beneath it to a considerable distance.

A few species, in which the toothing of the upper mandible is double, form the genus *BIDENS* of Spix, synonymous, we presume, with *Harpagus* of Vigors. Such are *F. bidentatus*, Lath., *F. diodon*, Temm. Pl. Col. 198. In *IERAX* of Vigors, the upper mandible seems as strongly and sharply bidentated as in the preceding, but the under one is simply notched, as in the true falcons, and the second quill-feather of the wing is the longest. This genus includes the beautiful little finch-falcon of Bengal, *F. carulescens*, the smallest of the hawk tribe. An elegant crested kind from Pondicherry serves as a type to the genus *LOPHOTES*.

We shall conclude this section by a brief indication of that remarkable bird, the secretary, or serpent-eater of Southern Africa—the *Gypogeraus serpentarius* of Illiger (see Plate CCCLXXXIX. fig. 9). Its affinities have been in no way satisfactorily illustrated, and each author has hitherto placed it according to his own fancy. Baron Cuvier locates it between the buzzards and the owls; M. Lesson makes it a "gallinaceous accipiter," in strange company with the horned screamer (*Palamedea cristata*) of Brazil; while Mr Swainson is now satisfied that it is no other than "the rasorial type of the aquiline circle." Be this as it

may, it has a strong, well-curved bill, a crested head, a Raptores. lengthened neck, and long, slender, crane-like legs. It is the only one of its genus, and has been designated by a variety of names. Some call it the messenger, because it runs with great rapidity, which few actual messengers ever do; others name it the secretary, because it has a pen-like plume behind its ear, where a secretary's pen should never be; while its frequent title of serpent-eater is probably better earned, by its useful habit of devouring those dangerous reptiles. Its diet, however, seems to be of a rather miscellaneous nature, as Le Vaillant found in the stomach of a single specimen twenty-one young tortoises, three snakes, and eleven lizards, besides which there was a large ball in the stomach, formed entirely of the scales of tortoises, the vertebrae of snakes and lizards, the legs of locusts, and the wing-cases of coleopterous insects. "In his habits," says Mr Bennet, "he partly resembles both the eagle and the vulture, but differs from them most completely in the nature of his prey, and in his mode of attacking it. Like the former, he always prefers live flesh to carrion; but the food to which he is most particularly attached consists of snakes and other reptiles, for the destruction of which he is admirably fitted by his organization. The length of his legs not only enables him to pursue these creatures over the sandy deserts which he inhabits, with a speed proportioned to their own, but also places his more vulnerable parts in some measure above the risk of their venomous bite; and the imperfect character of his talons, when compared with those of other rapacious birds, is in complete accordance with the fact, that his feet are destined rather to inflict powerful blows than to seize and carry off his prey. When he falls upon a serpent, he first attacks it with the bony prominences of his wings, with one of which he belabours it, while he guards his body by the expansion of the other. He then seizes it by the tail, and mounts with it to a considerable height in the air, from which he drops it to the earth, and repeats this process until the reptile is either killed or wearied out; when he breaks open its skull by means of his beak, and tears it in pieces with the assistance of his claws, or, if not too large, swallows it entire. Like the eagles, these birds live in pairs, and not in flocks; they build their airy, if so it may be termed, on the loftiest trees, or, where these are wanting, in the most bushy and tufted thickets. They run with extreme swiftness, trusting, when pursued, rather to their legs than to their wings; and as they are generally met with in the open country, it is with difficulty that they can be approached sufficiently near for the sportsman to obtain a shot at them. They are natives of the south of Africa, and appear to be tolerably numerous in the neighbourhood of the Cape, where, it is said, they have been tamed to such a degree as to render them useful inmates of the poultry-yard, in which they not only destroy the snakes and rats which are too apt to intrude upon those precincts, but even contribute to the maintenance of peace among its more authentic inhabitants, by interposing in their quarrels, and separating the furious combatants who disturb it by their brawls."²

SECT. II.—NOCTURNAL BIRDS OF PREY.

The great raptorial division called owls are usually distinguished by the comparative largeness of their heads, the anterior portion of which is surrounded by a peculiar circle of feathers forming a facial collar, to which they owe the most marked and peculiar feature of their physiognomy. The bill is curved almost from the base, where it is greatly enveloped by setaceous feathers, which fre-

¹ *Fauna Boreali-Americana*, part ii. p. 28.

² *Tower Menagerie*, p. 211.

Raptores. quently cover or conceal the cere and nostrils. The eyes are large, and so placed that vision is directed rather forwards than laterally, and are furnished with a nictitating membrane. The tarsi, and even the toes, are closely covered by short downy or hairy feathers. The outer toe is versatile; the claws extremely sharp. The plumage is remarkable for its great softness. The concha of the ear is for the most part very large; and from this we may infer that the sense of hearing is acute.

The greater proportion of the species hunt by night, or during the sweet but sombre hours of twilight. Their flight is light, buoyant, noiseless, and performed by slow but regular flapping of the wings. Their food, like that of most birds of prey, is various; but we believe they prefer mice and similar small quadrupeds, probably because the habits of these minute creatures are, like their own, nocturnal. Owls are solitary, seldom more than a pair being found together, although the woodcock owl (*Otus brachyotus*) is found during autumn in small conjoined family flocks of ten or twelve together; and the Arkansa owl of America is likewise in a manner gregarious. "There is something," says Wilson, "in the character of the owl so recluse, solitary, and mysterious, something so discordant in the tones of its voice, heard only amid the silence and the gloom of night, and in the most lonely and sequestered situations, as to have strongly impressed the minds of mankind in general with sensations of awe and abhorrence of the whole tribe. The poets have indulged freely in this general prejudice; and in their descriptions and delineations of midnight storms, and gloomy scenes of nature, the owl is generally introduced to heighten the horror of the picture."

The systematic arrangement of these nocturnal birds of prey is as yet unsatisfactory. The following is a brief view of Baron Cuvier's system.

The genus *OTUS* has two well-marked aigrettes, or tufts of feathers, on the front of the head, capable of being depressed or raised at pleasure, and the conch of the ear extends semicircularly from the beak almost to the top of the head, and is furnished in front with a membranous opercle. Two British species may be here placed, the long-eared or horned owl commonly so called (*Strix otus*), and the short-eared owl (*Strix brachyotus*). The genus *ULULA* consists of species resembling the preceding in the bill and auditory opening, but not possessed of aigrettes. Such is the great northern species (*S. Laponica*, Gm.). The genus *STRIX* properly so called has also large ear-openings, and wants the aigrettes, but is distinguished by the bill being comparatively straight at the base, and curved towards the extremity. The facial disk is strongly marked, the tarsi are feathered, and the toes are haired. Example, *Strix flammea*, our barn or white owl. In the genus *SYRNIIUM*, the facial disk is formed of decomposed or unwoven feathers, the collar is also large, and the aigrettes wanting, but the toes are feathered. See Plate CCCLXXXIX. fig. 6. The brown or wood owl of Britain (*S. aluco* and *stridula*, Linn.) is placed here. The genus *BUBO* has the facial disk less marked, the aigrettes conspicuous, and the toes feathered. The great eagle owl of Europe (*B. maximus*, *S. bubo*, Linn.) affords a good example. It inhabits the larger forests of Russia, Hungary, Germany, and Switzerland, becoming very rare in France, disappearing altogether in Holland, and visiting Great Britain as it were by chance. Here also may be placed the great horned owl of America, *S. Virginiana* (Plate CCCLXXXIX. fig. 8), which occurs in almost every quarter of the United States, and spreads into the far fur-countries of the north, wherever there is timber of sufficient size to serve the purposes of nidification.

His favourite residence, however, according to Wilson, is the dark solitudes of deep swamps, covered by a growth of gigantic timber, from whence, so soon as evening darkens, and the human race retire to rest, he sends forth his unearthly hootings, startling the way-worn traveller by his forest fire, and "making night hideous." "Along the mountainous shores of the Ohio, and amidst the deep forests of Indiana, alone, and reposing in the woods, this ghostly watchman has frequently warned me of the approach of morning, and aroused me by his singular exclamations, sometimes sweeping down and around my fire, uttering a loud and sudden *waugh o! waugh o!* sufficient to have alarmed a whole garrison. He has other nocturnal solos, no less melodious, one of which very strikingly resembles the half-suppressed screams of a person suffocating or throttled, and cannot fail of being exceedingly entertaining to a lonely benighted traveller in the midst of an Indian wilderness."¹ The genus *NOCTUA* consists of species in which the tufts or aigrettes are wanting, the concha of the ear small, with an ordinary-sized opening. The facial disk is likewise small and incomplete. This gives the countenance a more hawk-like physiognomy; and in accordance with this expression, we find the habits of the species naturally more diurnal than those of many other owls. We here place the northern *Harfang*, or great snowy owl (*Strix nyctea*, Linn.), one of the most beautiful of the group, an occasional visitant of Great Britain, and not very unfrequent in the Orkney and Shetland Islands. It is a common inhabitant of the arctic regions of both the old and new world, from which it migrates on the approach of winter, but without passing to the southward of the colder portions of the temperate zone. It frequently hunts by day; and indeed if it did not so, what would become of it in those far northern countries where a "sleepless summer of long light" knows not for months the refreshing influence of nocturnal darkness? It preys not only on quadrupeds and birds, but frequently strikes its talons into fish, and bears them astonished from their moist abode into the leafy recesses of the forest. There are few things more out of place than a trout on the top of a large tree. Its own flesh is said to be white and well flavoured; and when in good condition, is eaten both by the native Indians and the white residents in the fur-countries. Several of the smaller owls are included in the present genus, such as *Strix passerina*, Linn. In the genus *SCOPS* (Plate CCCLXXXIX. fig. 7) the toes are naked, and the head furnished with tufts; and in certain peculiar foreign species of considerable size, the tarsi (a very unusual character) are bare and reticulated. These have been formed of late into a genus called *KETUPA*. Example, *Strix Ketupa*, Horsfield; Temm. Pl. Col. 74.

One of the most curious of owls, in its habits, is the burrowing species of the new world—*Strix cunicularia* of Bonaparte. Its particular genus has not yet been determined. These birds inhabit the burrows of the marmot, and consequently dwell in open plains. They seem to enjoy even the broadest glare of the noon-day sun, and may be seen flying rapidly along in search of food or pleasure during the prevalence of the cheerful light of day. They manifest but little timidity, allow themselves to be approached sufficiently close for shooting, and though some or all may soar away, they settle down again at no great distance. If further disturbed, they either take a more lengthened flight, or descend into their subterranean dwellings, from whence they are dislodged with difficulty. When the young are only covered with down, they frequently ascend the entrance to enjoy the warmth of the mid-day sun; but as soon as they are approached, they quickly retire within their burrow. In North America the burrowing owl feeds

¹ American Ornithology, i. p. 101.

Insectores. chiefly on insects—in the West Indies (if the species are identical), on rats and reptiles.

those who are influential in the nomenclature of science should avoid bestowing appellations which convey an erroneous idea of the objects intended to be expressed.

ORDER II.—INSESSORES OR PERCHING BIRDS.¹

This is the most numerous order of the class of birds, and, as Cuvier has observed, is distinguished chiefly by negative characters; for it embraces all those various groups which, sometimes possessing but little in common, are yet in themselves neither raptorial, scansorial, grallatorial, natatorial, nor gallinaceous. At the same time they exhibit a general resemblance to each other in structure, and present such gradual transitions from group to group, as to render definite subdivisions by no means easy.

They are said to possess not the violence of birds of prey,—meaning thereby our preceding accipitatorial order. Yet a fly-catcher crushing the body of a slender-limbed and delicate gnat, a blackbird pertinaciously dragging a reluctant worm from its subterranean dwelling, or a sparrow with his bill as full of tortuous caterpillars as it can contain (to say nothing of the butcher-bird, which is said to impale his prey alive upon “the blooming spray”), is assuredly as raptorial or predaceous as need be well desired. Neither can the division of the smaller birds into granivorous and insectivorous be strictly maintained, though we doubt not that the strong, conical billed species eat most greedily of seeds and grain, while those of softer and more slender bill are chiefly avidous of insect life;—but all precise divisions, founded on the love of any special diet, must be received with reservation,—seeing that almost all passerine birds feed both themselves and young in spring and early summer with what may be correctly called animal food (that is, insects and worms), while in autumn and throughout the winter season they just as generally (and for the best of reasons) have recourse to all manner of seeds and grain. The tender-billed birds are certainly more dependent on insect food than the others, and it is consequently among them that we find the greater proportion of our migratory species; for as the increasing chilliness of autumn depopulates the busy world of insect life, so our finest songsters (the familiar red-breast forming a delightful exception) take then their departure for other climes, not so much by reason of the immediate influence of cold upon themselves, as because they find their accustomed food becoming daily less abundant. Such of the insectivorous tribes as remain with us throughout the year assuredly combine the graminivorous diet with their more favourite food, just as the hard-billed species sustain themselves during spring and summer by the capture of insects. In tropical countries, where the seasons are less strongly or differently marked, and the death-like torpidity of our northern winters is unknown, this periodical change of food may probably either not obtain, or be less perceptible in its occurrence; but as we know that over a great part of the globe it is true, that for one portion of the year most insect-eating birds feed on seeds, and that for another portion of the year most seed-eating birds feed on insects, we may be permitted to doubt the propriety of rigorously dividing the great body of passerine species into insectivorous and granivorous sections. We admit that, either from the nature of things, or the feebleness of human language, the terms applied to the greater divisions of natural history ought not to be construed according to their strictest literal interpretation, as they are frequently of a conventional character, and have in some cases been substituted for numerical signs, as more easily held in remembrance; but it is nevertheless to be greatly desired, that

The feet of the insectorial order are especially formed for perching, the hind toe springing from the same plane as the anterior ones,—a structure which gives them great power in grasping. Their legs or tarsi are always of moderate length, and the claws not strongly curved. The form of the bill is too various to be generalized; and the same may be said of the length of the wings, of which the comparative breadth generally bears relation to the habit of life of each particular tribe. The stomach is in the form of a muscular gizzard, generally preceded by a greater or less expansion in the shape of crop, and there are usually two very small cæca. The lower larynx is very complicated, especially among the various tribes of songsters. We must now rest satisfied with these brief and barren generalities. “The great order of Passeres or Insectores of authors,” Mr Macgillivray observes, “is so heterogeneous in its composition, that all who have attempted to characterize it, whether in few or in many words, have utterly failed; for this plain reason, that its various groups are as unlike to each other as they are to the Raptores or Rasores, and that in fact the only common features which they exhibit are those of the general organization of birds. A hornbill and a humming-bird, a parrot and a wren, a kingfisher and a swallow, a starling and a toucan, not to mention others still more dissimilar, are surely as unlike each other as a hawk and a shrike, a pigeon and a plover, or a flamingo and a pelican.”²

The first principal division of the passerine birds consists of those genera in which the external toe is united to the internal by not more than one or two of the joints, and contains the four great tribes of *Dentirostres*, *Fissirostres*, *Conirostres*, and *Tenuirostres*.

TRIBE 1ST.—DENTIROSTRES.

Bill with a marginal notch towards the extremity of the upper mandible.

The dentirostral tribe is composed chiefly of insectivorous groups, and, according to the modern views, contains the following five families, viz. *Laniadæ*, *Merulidæ*, *Sylviadæ*, *Ampelidæ*, and *Muscicapidæ*. We do not think the general reader, with whose tastes the treatises in our Encyclopædia are for the most part made to conform, would be benefited by our entering into the complexities of these circular arrangements, or by an extended exposition of the innumerable minor groups of which the families are composed. We shall therefore here content ourselves by noticing the principal generic groups which form as it were the groundwork on which the more elaborate systems have been erected, and with which it is necessary to become familiar in their more general and comprehensive form, before their minuter subdivisions (to be elsewhere studied) can be understood. The genera are chiefly determined by the form of the bill, which is strong and compressed among the shrikes and thrushes, depressed in the flycatchers, rounded and thickish in the tanagers, slender and pointed in the warblers,—but in each and all exhibiting different degrees of the typical character, or a tendency to transition, which admits of various systematic views.

Mr Swainson divides the Laniadæ or shrikes into five sub-families, viz. *Laniana*, or true shrikes; *Thamnophilina*, or bush-shrikes; *Dicrurina*, or drongo shrikes; *Ceblepyrina*, or caterpillar catchers; and *Tyrannina*, or tyrant shrikes; and each of these contains a great variety of ge-

¹ PICÆ and PASSERES, Linn.

² *British Birds*, vol. i. p. 311.

Insessores. nera and subgenera. We shall here follow the outlines of Baron Cuvier's system, which we shall illustrate by occasional figures.¹

In the genus *LANIUS*, the bill is of moderate size, but strong, somewhat triangular at the base, and laterally compressed. In the European species (which we call butcher-birds) the upper mandible is somewhat arched. Three of these (*Lan. excubitor*, *colurio*, and *rufus*) are natives of England, but the first and last are very rare. The food of butcher-birds consists chiefly of insects, but they attack occasionally the smaller kinds of birds and quadrupeds. Their mode of flight is irregular, the tail being kept in constant agitation. The sexes differ from each other in their plumage, and the immature birds bear a resemblance to the adult females. In most of the species the moult is single, in others double, that is, certain parts of the plumage are changed twice a year. Our great cinereous shrike (*L. excubitor*) destroys its larger prey by strangulation, and transfixing it after death upon a thorn, tears it into smaller parts at leisure. This wise but somewhat savage instinct seems implanted in the bird to make amends for the comparative weakness of its feet and claws. "This singular process," says Mr Selby, "is used with all its food. I had the gratification of witnessing this operation of the shrike upon a hedge accentor (*A. modularis*) which it had just killed; and the skin of which, still attached to the thorn, is now in my possession. In this instance, after killing the bird, it hovered with the prey in its bill for a short time over the hedge, apparently occupied in selecting a thorn fit for its purpose. Upon disturbing it, and advancing to the spot, I found the accentor firmly fixed by the tendons of the wing at the selected twig. I have met with the remains of a mouse in the stomach of a shrike; and Montagu mentions one in which he found a shrew."²

We have figured, in illustration of the genus *Lanius*, the species called *fiscal* (*L. collaris*) by Vaillant. See Plate CCCXC. fig. 1. When this bird sees a locust, mantis, or small bird, it springs upon it, and immediately impales it on a thorn, with such dexterity, that the spine always passes through the head. It is a bold, vindictive, noisy, and even cruel bird, for it seems to kill many more victims than it actually requires for food. These are found transfixed on many a neighbouring bush and tree, the major part often so destroyed by dryness as to be totally unfit for food.

Some foreign species, in which the upper ridge of the bill is straight, and the point only curved, form the genus *THAMNOPHILUS* of Vieillot. The *Thamnophili* inhabit chiefly the tropical regions of the new world, but some of the species have an extensive range, from Canada as far southwards as Paraguay. In *Tham. guttatus* of Spix the bill is very strong, and the inferior mandible inflated. In others it is straight and slender, with its base adorned with reversed setaceous feathers. Such is *L. plumatus*, an African species, which forms the genus *PRIONOPS* of Vieillot.

In the genus *VANGA* (Plate CCCXC. fig. 3) the bill is large, greatly compressed throughout, the point of the upper mandible suddenly curved, the under mandible bent upwards. Example, *Lan. curvirostris*, Gmelin. In *OCYPTERUS*, Cuv. the bill is conical, rounded, scarcely arched towards the point, the termination very sharp and fine, slightly notched. The legs are rather short, and the wings long, from which characters the species have obtained the name of swallow butcher-birds; but they are

as courageous as other shrikes, and do not fear to attack *Insessores*. even crows. The species are numerous along the shores and islands of the Indian Seas, where they exhibit great agility in the capture of their insect prey. Ex. *Lan. leucorhynchos*, Gm. In *BARYTA* of Cuv. the bill is large, conical, straight, round at the base, and encroaching on the forehead by a circular notch; the ridge is rounded, the sides compressed, the point curved. The nostrils are small and linear. The species of this genus, as well as those of *Vanga*, are by some combined with the crows, as part of the conirostral tribe. We may name, as an example, the piping grackle of the older writers (*Coracias tibicen*, Lath.), a native of New Holland, where it is known by the name of *Jarra-war-nang*. It preys on small birds, and is said to have a melodious voice, resembling the tones of a flute. The genus *CHALYBÆUS*, Cuv. has the bill resembling the preceding, but rather thicker at the base, and the nostrils are pierced in a broad membranous space. See Plate CCCXC. fig. 6. The species are natives of New Guinea, and are remarkable for their beautiful tints of burnished steel. *C. paradisæus* has the feathers on the head and neck like frizzled velvet, and was first described by Sonnerat as a bird of paradise.—*Par. viridis*, Gmelin. In *PSARIS* of Cuvier the bill is conical, thick, round at the base, but not encroaching on the front, slightly compressed, and curved at the extremity. The genus is founded on the Cayenne shrike of Latham, *Lanius Cayanus*, Linn.³ It now contains many species, all classed by Mr Swainson among the Muscipidæ or flycatchers. Their habits are said to resemble those of the butcher-birds. The genus *GRAUCULUS*, Cuv. has the bill less compressed than in *Lanius*, the upper ridge sharp, equally curved throughout its whole extent, the commissure or cutting edges also slightly bent. The hairs which sometimes cover the nostrils ally these species to the crows, from which they are distinguished by the notching of the bill. Their prevailing hues are ash-colour, and they are native to the Indian islands. Cuvier here places the beautiful *Irena puella* of Dr Horsfield, a Javanese species, of a fine velvet black, the back splendid ultramarine blue. It is ranged by others with the Orioles. To the same genus he likewise refers the Papuan and New Guinea crow (*C. papuensis* and *Novæ Guineæ*), and the *Piroll* of Temminck, of which the male and female differ so remarkably, the former being of a glossy blue, the latter greenish. This last species forms the genus *Ptilonorhynchus* of Kuhl,—*Kitta* of M. Lesson. It is the satin-bird of the colonists of Port Jackson, a solitary, fearful creature, which seldom leaves the cover of the umbrageous woods. The Australian natives call it *cowry*.

In *BETHYLUS*, Cuv., the bill is thick, short, bulged, slightly compressed towards the end. Its type is the magpie-shrike of Latham, *L. picatus*, an inhabitant of Guiana and Brazil. Plate CCCXC. fig. 2. In *FALCUNCULUS* the bill is much compressed, almost as high as long, the culmen arched. It contains the *Lanius frontatus* of New Holland. The genus *PARDALOTUS* (which M. Lesson places with the tit-mice, and Mr Swainson with the manakins) is likewise constituted by a New Holland species, the *Pipra punctata* of Shaw. The bill is short, obtuse, convex, and slightly compressed.

All the preceding genera of the dentirostral tribe are supposed by Baron Cuvier to be more or less allied to *Lanius* of Linnæus. A great diversity of opinion, however, exists regarding their natural distribution; and in the most recent systems they will be found differently

¹ For more minute details, the student may consult Mr Swainson's "Inquiry into the Natural Affinities of the Laniadæ or Shrikes," *Zoological Journal*, No. iii. p. 289.

² *Illustrations of British Ornithology*, vol. i. p. 149.

³ See *Zool. Journal*, No. vii. p. 354, and No. viii. p. 483.

Insectores. and variously disposed, according to the views of each particular author.

Many of the genera next ensuing are more allied to the fly-catchers, *Muscipidae*; but not a few are classed by recent writers among the *Laniadæ* and *Ampelidæ*. The bill is of medium size, broad at the base, horizontally depressed, almost straight, generally wider than high, the point more or less hooked and notched. The mouth is garnished with bristly feathers projecting forwards. Their food varies according to their size and strength,—the more powerful species seizing occasionally on small birds as well as insects, the more feeble being satisfied with the latter kind of prey.

In the genus *TYRANNUS*, Cuv., the bill is straight, lengthened, strong, the culmen rounded, the point suddenly hooked. See Plate CCCXC. fig. 5. The species consist chiefly of Linnæan fly-catchers, with a few shrikes. They are all native to America, and, as their name implies, are fierce and domineering in their disposition. They will defend their young against the boldest aggressor, and have been seen to drive from their nesting-places even the largest birds of prey. As an example, we may here name the king-bird, or tyrant fly-catcher, of the new world, *T. intrepidus*. This species is one of the most remarkable for the boldness and intrepidity which he displays in his attacks on the strongest of the feathered race. During the earlier months of summer, indeed, his life is one continued scene of broil and battle. According to Wilson, hawks and crows, the bald eagle, and the great black eagle, all equally dread an encounter with this dauntless creature, who, as soon as he perceives a bird of prey, however powerful, in his neighbourhood, darts into the air, and quickly ascending above his supposed enemy, pounces with violence upon his back, and continues his attack till his own domains have been departed from. He is likewise in some measure obnoxious to the human race, on account of his love of bees; for he will take post on a fence or garden-tree in the vicinity of hives, and make continual sallies on the industrious tenants, as they pass to and from their never-ceasing labours. His great American biographer, however, is of opinion, that whatever prejudice may prevail against him for such depredations, he is on the whole greatly the friend of man, by destroying multitudes of insects, whose larvæ prey on the produce of the field and garden. The tyrant has been immortalised in verse as well as prose:

Far in the south, where vast Maragnon flows,
And boundless forests unknown wilds enclose,
Vine-tangled shores and suffocating woods,
Parch'd up with heat, or drown'd with pouring floods;
Where each extreme alternately prevails,
And nature sad their ravages bewails;
Lo! high in air above those trackless wastes,
With spring's return the king-bird hither hastes;
Coasts the famed gulf, and from his height explores
Its thousand streams, its long indented shores,
Its plains immense, wide opening on the day,
Its lakes and isles, where feather'd millions play:
All tempt not him: till gazing from on high,
Columbia's regions wide below him lie;
There end his wanderings and his wish to roam,
There lie his native woods, his fields, his home;
Down, circling, he descends from azure heights,
And on a full-blown sassafras alights.

Fatigued and silent, for a while he views
His old-frequented haunts, and shades recluse;
Sees brothers, comrades, every hour arrive,—
Hears, humming round, the tenants of the hive;
Love fires his breast,—he woos, and soon is blest,
And in the blooming orchard builds his nest.

The king-bird migrates in summer at least as far north as the fifty-seventh parallel. It reaches Carlton House in the month of May, and retires southward in September. A new species has been of late years discovered on the banks of the Saskatchewan, but nothing is yet known of its habits. It is described by Mr Swainson under the title of *Tyrannus borealis*. It is considerably smaller than the preceding, and may at once be distinguished by its forked tail, not tipped with white.¹ The other species are numerous.²

A still more extensive genus is that named *MUSCIPETA*, Cuv. The bill is long, much depressed, twice as broad as high even at the base, the culmen usually very blunt, the margins forming an oval curve; the point feebly notched, and the base covered by long, setaceous feathers. The general form of the species is feeble compared with that of the preceding, and they prey exclusively on insects. They are extremely beautiful, often adorned by crests upon the head, or by gracefully elongated feathers in the tail. The majority are native to Africa and India. The paradise fly-catcher of Le Vaillant may be named as an example.

In the genus *PLATYRHYNCHUS* of Desm., the bill is short, and still broader and more depressed than in the preceding. *P. cancrum* inhabits Brazil. These birds are by some conjoined with *Todus*, to which they are assuredly allied. Certain species, of which the feet and legs are long and slender, and the tail extremely short, form the genus *CONOPHAGA* of Vieillot. The fly-catchers properly so called, genus *MUSCICAPA*, Cuv., have the beard or bill-feathers less extended than in *Muscipeta*, and the bill itself is narrower, the ridge or culmen is distinctly marked, the margins straight, the point slightly bent. The species are peculiar to the ancient continent, and not more than four or five occur in Europe. Of these, two are British, *M. grisola*, or the spotted fly-catcher, a well-known and common species; and *M. luctuosa*, or the pied fly-catcher, which is very rare. We have seen it on the banks of the Eden in Cumberland. Both are birds of passage. The species of this genus take their insect prey upon the wing, darting upon it at intervals from some favourite twig. The males and females differ considerably in their markings, especially in spring and summer, although the former sex (at least in *M. albicollis*, Temm.) are scarcely to be distinguished from the latter throughout the winter season. The modifications in the form of the bill in this extensive genus have led to the formation, so far as concerns exotic species, of a vast number of sectional groups, or subgenera, the characters of which we cannot here detail.

We now arrive, in accordance with Baron Cuvier's system, though not, we fear, by natural transition, at the genus *GYMNOCEPHALUS*, of which the beak resembles that of *Tyrannus*, except that the ridge is more arched, and a great portion of the face is bare of feathers. See Plate CCCXC. fig. 8. There seems to be only a single species, commonly called the bald crow (*G. calvus*), a bird about the size of a rook, of a uniform tobacco-brown colour, the feathers of the wings and tail black. It is called *oiseau mon prère* by the Creoles of Cayenne, probably from its capucin aspect. Its bald front bestows upon it a very singular physiognomy. Vaillant regards the absence of feathers on that part as accidental; and he mentions in a note,³ that he received a specimen from Cayenne, in which the face was plumed. But M. Lesson states that he has examined more than twenty specimens, and has always found the face unfeathered.

The genus *CEPHALOPTERUS*, on the contrary (see Plate

¹ See *Fauna Boreali-Americana*, part ii. pl. lxxxv.

² Consult Mr Swainson's "Monography of the Tyrant Shrikes of America," *Journal of the Royal Institution*, No. xl.

³ *Histoire des Oiseaux de Paradis*, t. i. p. 109.

In-sessores. CCCXC. fig. 4), has the front adorned by a very peculiar tuft of feathers, which, rising upwards, and then spreading around and drooping downwards, shades the head, as it were, beneath a parasol. Another expanded and lengthened set of plumes hangs in an apron-like fashion from the breast. The prevailing plumage is deep black, the parts first mentioned having a metallic lustre. The bill of the only species known (*C. ornatus*) is robust, the mandibles nearly equal, the upper being convex, without notch, and scarcely bent at the extremity. This bird was brought to Paris, from the Lisbon Collection, by M. Geoff. St Hilaire, and was believed to have been sent originally from Brazil. As that country, however, has been so much explored without the *Cephalopterus* having ever since been met with, it is more likely, M. Temminck thinks, to have been obtained in the less-frequented countries of Peru, or the coast of Chili. On the other hand, M. Lesson alleges, that he was informed by a well-instructed Portuguese, that the bird in question came from Goa. It is the *Coracina cephaloptera* of M. Vieillot. We have no doubt it is a South American species.

From these singular birds we proceed to the Cotingas or chatterers, genus *AMPELIS*, Linn., a varied and beautiful family, now partitioned into several minor groups. They have all the depressed bill of the fly-catchers in general, but it is rather shorter in proportion, broadish, and slightly arched.

Those in which the bill is the strongest and most pointed, with dilated margins, are characterized by an insectivorous regime. These are the *pihahaus* of South America, genus *QUERULA*, Vieil. The species fly in troops through the forests. Here are placed the *Cotinga rouge* of Vailant, or *Ampelis phœnicia*, also the *Ampelis cinerea* and *Muscicapa rubricollis* of Gmelin. In the ordinary Cotingas (or genus *AMPELIS* properly so called) the bill is more feeble, little elevated, deeply cleft. The species inhabit moist places, and are remarkable for the rich and lustrous plumage of the males during the breeding season. We here place the *Ampelis pompadoura*, *carnifex*, and *cotinga*, Linn. In the genus *BOMBYCILLA*, Brisson, which includes our European or Bohemian chatterer, the head is ornamented by an elongated crest, and the majority of the species have the secondary feathers of the wings terminated by a small oval expansion, resembling a bit of scarlet sealing-wax. These birds prefer wild fruits to insects. The appetite of the American species (*A. Americana*) is stated by Mr Audubon to be of so extraordinary a nature as to prompt it to devour every fruit and berry in its way. In this manner it will gorge itself to such excess as to be sometimes unfit to fly, and may then be taken by the hand. "I have seen some which, though wounded and confined to a cage, have eaten apples until suffocation deprived them of life."¹ Our author adds, however, that they are also excellent fly-catchers, spending much of their time in pursuit of winged insects. They become very fat during the fruit season, and are then so tender and juicy as to be much sought for as an article of epicurean diet. They inhabit the United States throughout the year. The habits of the European wax-wing (*A. garrula*) are much less known. It not unfrequently visits Britain during winter, and is supposed to breed within the arctic circle. It likewise inhabits North America, but has not been observed to the southward of the fifty-fifth parallel. Dr Richardson observed a flock of three or four hundred on the banks of the Saskatchewan in May. During their trips to Britain they feed, when they can get them, on the berries of the mountain ash; and Sir William Jardine found the stomachs of one or two killed near Carlisle to be cram-

med with holly-berries. A third species was some time ago discovered by Dr Seibold in Japan. It is the *B. phœnicoptera* of Temminck, and wants the wax-like appendages to the wings.

In the genus *CASMARHYNCHUS*, Temm., the bill is remarkably broad, greatly depressed, soft and flexible at the base, of a harder consistence, and somewhat compressed towards the extremity. The nostrils are large and open, and placed far forward on the bill. As an example, we may name that singular bird the araponga (*Cas. nudicollis*, Temm. *Pl. Col.* 368-83), a Brazilian species, remarkable for the metallic resonance of its cry, which sounds like the clinking of a blacksmith's hammer. By reason of this peculiarity, it is known to the Brazilians by the name of *O. ferrador*, or the blacksmith. The adult male is pure white, the face and front of the neck nearly bare, of a green colour, sprinkled with a few small black feathers. The female is green, spotted on the under parts with white, the upper plumage of the head nearly black. The young at first resemble the mother, and adolescent males are found with a mingled plumage of green and white. Another species, of nearly corresponding plumage, is distinguished by a long, fleshy, sometimes slightly feathered caruncle, hanging from the basal front of the upper mandible. It is erectile, and sometimes projects upwards. This is the *Ampelis carunculata* of the older systematic writers. We presume it to be also the *Campanero* of the Spaniards, called *dara* by the Indians, and bell-bird by the English. "It is about the size of a jay," says Waterton. "His plumage is white as snow. On his forehead rises a spiral tube nearly three inches long. It is jet black, clothed all over with small white feathers. It has a communication with the palate, and when filled with air looks like a spire; when empty, it becomes pendulous. His note is loud and clear, like the sound of a bell, and may be heard at the distance of three miles. In the midst of these extensive wilds, generally on the top of an aged mora, almost out of gun reach, you will see the campanero. No sound or song from any of the winged inhabitants of the forest, not even the clearly pronounced 'Whip-poor-will,' from the goat-sucker, causes such astonishment as the toll of the campanero. With many of the feathered race, he pays the common tribute of a morning and an evening song; and even when the meridian sun has shut in silence the mouths of almost the whole of animated nature, the campanero still cheers the forest. You hear his toll, and then a pause for a minute; then another toll, and then a pause again; and then a toll, and again a pause. Then he is silent for six or eight minutes, and then another toll, and so on. Actæon would stop in mid chase, Maria would defer her evening song, and Orpheus himself would drop his lute, to listen to him, so sweet, so novel, and romantic is the toll of the beautiful snow-white campanero. He is never seen to feed with the other Cotingas, nor is it known in what part of Guiana he makes his nest."² In a third species (*Amp. variegata*, Gmel. *Pl. Col.* 51, Plate CCCXC. fig. 10) the front of the throat is all beset with numerous fleshy worm-shaped appendages. All these birds are vaguely said to feed upon insects, but on no authority that we can find. "Could we but know," says Mr Swainson, "the habits and economy of these singular birds, which, had they not been seen, might be thought fabulous, what an interesting page of nature's volume would be unfolded! Yet at present we only know that they live in the deepest and most secluded forests of tropical America, where they subsist upon an infinite variety of fruits unknown to Europeans. They are much oftener heard than seen, since their notes are particularly loud, and are ut-

¹ *Ornithological Biography*, vol. i. p. 227.

² *Wanderings in South America*, p. 121.

Insectores. tered morning and evening from the deepest recesses of the forests. We have sometimes caught a distant view of them, perched upon the topmost branches of the loftiest trees."¹

In the genus *PROCNIS* (now more restricted than by Hoffmansegg) the bill is likewise very broad, and deeply cleft, but the structure is firmer, and the upper mandible more convex. The nostrils are basal. Example, *P. ventralis*, Illiger, *Pl. Col.* 5.

In the not very closely allied genus *CEBLEPYRIS*, Cuv. which Mr Swainson classes as the most aberrant division of the shrikes, the bill resembles that of the Cotingas, but the shafts of the rump-feathers are sharp pointed. These birds inhabit chiefly Africa, and prey on caterpillars. Example, *C. phanicopterus*, Temm. *Pl. Col.* 71.

The genus *GYMNODERA*, Geoff. (which forms a portion of the *Coraciinae* of Vieillot), has the bill stronger than in any of the preceding *Ampelidæ*, the neck is partially bare, and the head covered with velvety feathers. There does not seem to be more than one species (*G. nudicollis*), described by Shaw under the name of bare-necked grackle. It was classed by Gmelin and Latham as a crow,—the *Corvus nudus* of their respective works.

The Drongos (genus *EDOLIUS*, Cuv.) have the bill partially depressed and notched, and its upper ridge sharp; but it is distinguished by both mandibles being slightly arched through their whole extent, and the nostrils are covered with feathers. The species are rather numerous, and are characteristic of the tropical countries of the East. The Malabar shrike of Shaw (*Edolius remifer*, Temm. see Plate CCCXC. fig. 7) affords a good example. The position of this genus ought certainly to be in closer approximation to the *Laniadæ* than it is in the arrangement of Baron Cuvier. Their habits are insectivorous, and some of the species are said to warble as sweetly as the nightingale. They usually dwell together in society, pursue bees with great avidity, and are often seen to combine in large groups on the outskirts of the forests during morning and evening. The species we have figured is a native of Java and Sumatra.

In the genus *PHIBALURA* of Vieil. the ridge of the bill is arched, as in *Edolius*, but shorter, broad at the base, somewhat dilated laterally, and slightly notched. The only known species is a beautiful South American bird (*Ph. flavirostris*, Vieil.; *Ph. cristata*, Swain., *Zool. Illust.* pl. xxxi.), which appears to occur chiefly in the mining districts of Brazil. It was very rare a few years back, but has now become comparatively common in collections, in consequence of several recent importations.

We come now to an extensive group, the ancient Tanagers, genus *TANAGRA* of Linn., which, like most of the other genera, has in recent times been numerous subdivided. The bill is convex, sub-triangular at the base, the upper mandible slightly arched, curved at the point, notched, the margins flexuous and enlarged; the nasal fossæ are deep and large, and closed by a membrane; the nostrils are rounded. The wings are rather short. The Tanagers are characteristic of America. They feed both on grain and insects, and are remarkable for the beauty and brilliancy of their plumage. The following are the principal subdivisions. In *EUPHONIA*, Desm. (*Tangaras bouwreuilis*, Cuv.), the bill is short, and exhibits, when viewed vertically, an enlargement at the base on either side. The tail is also short in proportion. Examples,—*Tan. violacea*, Lath.,—*Pipra musica*, Gmel.,—*Tan. diademata*, Pl. Col. 243,—and *Tan. chlorotica*, Gmel. See Plate CCCXC. fig. 9. In the genus *SALTATOR*, Vieil. (*Tangaras grosbec*, Cuv.), the bill is conical, thick, inflated, as broad as high, the culmen rounded. Such are *Tan. magna*, *atra*,

flammiceps, &c. In the restricted genus *TANAGER* (properly so called) the bill is short, though longer than in *Euphonia*, as broad as high, slightly compressed. Examples, *T. tricolor*, *thoracica*, *auricapilla*, &c. In the genus *TACHYPHONUS*, Vieil. (*Tangaras loriots*, Cuv.), the bill is more lengthened, conical, compressed, arched, sharp pointed. Examples, *T. cristata*, *nigerrima*, &c. In the genus *PYRANGA*, Vieil. (*Tangaras cardinals*, Cuv.), the bill is strong, lengthened, the point but slightly curved, the margin of the upper mandible often strongly toothed. The wings are rather long. The habits of several of the species of this genus are better known than those of the preceding, in consequence of their more hardy constitution, which enables them to spend the summer months in North America. One of the most beautiful of these is the scarlet tanager (*Tanagra rubra*, Linn.). Among all the birds that inhabit the woods of the United States, there is none, according to Wilson, that strikes the eye of a stranger, or even of a native, with so much brilliancy as this. Seen among the green leaves, with the light falling strongly on his plumage, he appears most beautiful. His whole plumage, with the exception of the wings and tail, is of the most vivid carmine red. The wing-coverts, posterior secondaries, and middle tail-feathers, are black, and form a rich contrast to the other portions of the plumage. After the autumnal moult the male becomes dappled with greenish yellow. The colour of the female is green above and yellow below; her wings and tail are brownish-black, edged with green. Though this lovely species sometimes builds in orchards, and visits cherry trees for the sake of their fruit, it does not frequently approach the habitations of man, but prefers the solitude of the umbrageous woods, where, in addition to fruits, its food consists of wasps, hornets, and humble-bees. The scarlet tanager comes just within the limits of the fur-countries, but is unknown as yet beyond the forty-ninth degree. His nest, placed upon the horizontal branch of a tree, is built of broken flax and dry grass, so thinly woven that the light is easily seen through it. The eggs are only three in number, of a dull blue, spotted with brown; but the bird is supposed to breed more than once a year. The genus *Pyrranga* contains also *Tan. aestiva* and other species.

We conclude our notice of the Tanagers by a brief indication of the genus *RAMPHOCES*, Vieil., of which the bill is strong, compressed, with the sides of the lower mandible so enlarged as to spread backwards towards the cheek. Such is *Tanagra Jacapa* of Gmelin, a South American species, represented in Plate CCCXCI. fig. 2.

Our next group consists of birds more or less allied to thrushes. In all, the bill is compressed and arched, but the upper mandible is but slightly hooked, and the notching feeble. As in other extensive assemblages of species, however, the structure is considerably varied. The natural regimen is mingled, consisting both of wild fruits, worms, and insects. A few species are gregarious, the majority solitary. Of ten or twelve kinds which inhabit Europe, we have six in Britain, viz. the missel-thrush (*T. viscivorus*), the song-thrush (*T. musicus*), the field-fare (*T. pilaris*), the red-wing (*T. iliacus*), the blackbird (*T. merula*), and the ring-ouzel (*T. torquatus*). The aspect and general habits of most of these are too familiar to require illustration. The blackbird and the thrush are two of our most delightful and accustomed songsters.

When snow-drops die, and the green primrose leaves
Announce the coming flower, the merle's note
Mellifluous, rich, deep-toned, fills all the vale,
And charms the ravished ear. The hawthorn bush,
New budded, is his perch; there the gray dawn

Insessores.

He hails, and there, with parting light, concludes
His melody. There, when the buds begin
To break, he lays the fibrous roots, and see
His jetty breast embrowned; the rounded clay
His jetty breast has soiled: but now complete,
His partner and his helper in the work,
Happy assumes possession of her home:
While he upon a neighbouring tree his lay,
More richly full, melodiously renews.

.....The thrush's song
Is varied as his plumes; and as his plumes
Blend beauteous, each with each, so run his notes,
Smoothly, with many a happy rise and fall.
Sometimes below the never-fading leaves
Of ivy close, that overtwinning binds
Some riven rock, or nodding castle wall,
Securely there the dam sits all day long;
While from the adverse bank, on topmost shoot
Of odour-breathing birch, her mate's blythe chaunt
Cheers her pent hours, and makes the wild woods ring.¹

The missel-thrush is the largest and strongest of the genus, at least in Europe. He is a bold, pugnacious bird, guarding his nest with great success from the intrusive magpie. His song is loud and clear, but monotonous; something like an ineffectual attempt to combine the tones of the thrush and blackbird. Yet Colonel Montagu admired it greatly. The ring-ouzel affects mountainous and barren places. The field-fare and red-wing are only seen with us in winter, and are known to breed in the more northern parts of Europe. The former sings well, and we have somewhere seen it called the nightingale of Norway.

One of the most noted of the foreign species of the genus is the mocking-bird of America, *T. polyglottus*, Linn. It measures about nine inches in length, is cinereous above, whitish below, with the tips of the wing-coverts, the base of the primaries, and the lateral tail-feathers white. This unrivalled Orpheus and great natural wonder of the American forests inhabits the whole northern continent from the state of Rhode Island to the larger islands of the West Indies, and, continuing through the equatorial regions, is found as far south as Brazil. Neither is it confined to the eastern or Atlantic states, being known to exist in the wild territory of the Arkansa, more than a thousand miles from the mouth of Red River. It breeds around the far western sources of the Platte, near the very base of the Rocky Mountains; and Mr Bullock observed it on the table-land of Mexico. The mocking-bird may be regarded as a permanent (we mean stationary) inhabitant of the milder regions of the western world, though such as are bred to the north of the Delaware seem to move southwards before the approach of winter.² The period of incubation varies with the latitude. A solitary thorn, an almost impenetrable thicket, an orange tree, cedar, or holly bush, are favourite places; and during this important period neither man nor beast can approach without being attacked. Cats are especially persecuted; yet his chief and most vengeful rage is directed against the black snake, a mortal enemy. The male bird darts upon the insidious reptile with the greatest courage, and by violent and incessant blows upon the head, sometimes deprives him of life. The boasted fascination of his race, his lurid eye, his sharp venomous fangs, avail not when competing with the love of offspring, that pure and beautiful affection, the least selfish of all instinctive feelings. "The plumage of the mocking-bird," says the first great historian of the American feathered tribes, "though none of the homeliest, has nothing gaudy or brilliant in it; and had he nothing else to recommend him, would scarcely entitle him to notice; but his figure is well proportioned, and even handsome. The ease, elegance, and rapidity of

his movements, the animation of his eye, and the intelligence he displays in listening and laying up lessons, from almost every species of the feathered creation within his hearing, are really surprising, and mark the peculiarity of his genius. To these qualities we may add that of a voice full, strong, and musical, and capable of almost every modulation, from the clear mellow tones of the wood-thrush to the savage scream of the bald eagle. In measure and accent he faithfully follows his originals. In force and sweetness of expression he greatly improves upon them. In his native groves, mounted on the top of a tall bush or half-grown tree, in the dawn of dewy morning, while the woods are already vocal with a multitude of warblers, his admirable song rises pre-eminent over every competitor. The ear can listen to his music alone, to which that of all the others seems a mere accompaniment. Neither is this strain altogether imitative. His own native notes, which are easily distinguishable by such as are well acquainted with those of our various song birds, are bold and full, and varied seemingly beyond all limits. While thus exerting himself, a bystander, destitute of sight, would suppose that the whole feathered tribes had assembled together on a trial of skill, each trying to produce his utmost efforts, so perfect are his imitations. He many times deceives the sportsman, and sends him in search of birds that perhaps are not within miles of him, but whose notes he exactly imitates; even birds themselves are frequently imposed on by this admirable mimic, and are decoyed by the fancied calls of their mates, or dive with precipitation into the depth of thickets, at the scream of what they suppose to be the sparrowhawk."³

The mocking-bird sometimes breeds in captivity. Many years ago a Mr Klein, of Philadelphia, partitioned off a space of twelve feet square within doors, lighted by a pretty large wire-grated window. In the centre he placed a cedar-bush, five or six feet high, in a box of earth, and scattered about a sufficient quantity of materials suitable for building. A male and female mocking-bird were introduced, and soon began to build. When the nest was completed the female laid five eggs, all of which she hatched, and she fed the young with great affection till they were nearly able to fly. Business, unfortunately, called the proprietor from home for a fortnight, and the care of the colony being left to the domestics, the result may be anticipated. On his return the young were utterly dead, and the parents nearly famished.

Several African species allied to our present group dwell together like starlings, in numerous chattering flocks, pursuing insects, and committing great depredations in gardens. Several are remarkable for the lustrous splendour of their plumage. Such are *Turdus auratus* and *nitens* of Gmelin. The Senegal species, called the glossy thrush, *T. aeneus*, is characterized by the magnificent length of its caudal plumes. These richly attired species belong to the genus *LAMPROTORNIS*, Temm. Other species, in which the bill is slender and lengthened (as in the Brazilian thrush of Lath.), form the genus *IXOS* of the last-named author; while the genus *ENICURUS* (more nearly related, however, to the fly-catchers) consists of one or two species with a stronger bill, the tail long and forked. Such is *E. coronatus*, Temm. *Pl. Col.* 113; and *E. velatus*, *ibid.* 160, from Java. *GRALLINA* of Vieillot is constituted by a New Holland species with a straight, lengthened, rather rounded bill, and long legs. The plumage is black and white. Ex. *G. melanoleuca*, Vieil. The genus *TRICHOPOHORUS*, Temm. is composed of species of which the bill is very strong, and garnished at the base with long, projecting bristles, which sometimes prevail also on the

¹ Grahame's *Birds of Scotland*.² Nuttall's *American Ornithology*, i. 321.³ Wilson's *American Ornithology*, ii. 92.

Insessores. occiput. The manners of these birds are as yet unknown. They live in Western Africa. Ex. *Tr. barbatus*, Temm. *Pl. Col.* 88.

The ant-thrushes, *MYOTHERA*, Illiger, come next in order. They are chiefly distinguished by their long, slender tarsi, and short tails. See Plate CCCXCI. fig. 1. The species of the ancient world, inhabitants for the most part of India, the eastern islands, and New Holland, are characterized by brilliant and contrasted colouring. These are the *Breves* of Buffon, the short-tailed crows of English writers. They form the genus *PITTA* of Vieillot and Temm., of which the bill is strong but thrush-like (*P. cyanurus*, *brachyurus*, &c.); while *MYOTHERA*, as now restricted, contains the American species, of much more sober plumage, with the bill more abruptly hooked, and the tooth stronger. The species dwell among the enormous ant-hills of the western world, keeping much upon the ground. They seldom fly, and certain kinds are remarkable for their deep sonorous voices. The largest, longest legged, and most singular in its general aspect, known under various names, such as long-legged crow, king-thrush, &c. (*Corvus grallarius*, Shaw; *Turdus rex*, Linn.), constitutes the genus *GRALLARIA* of the modern systems. It is a native of Guiana. The beautiful New Holland bird, with a bill like a thrush, but shorter, the legs long, the nails almost straight, and the lengthened tail-feathers terminated by sharp points, forms the genus *ORTHONYX*, and is placed by Cuvier immediately after the preceding group of ant-eating thrushes.

The genus *CINCLUS*, Bechstein, characterized by an almost straight, compressed, sharp-pointed bill, comprises our well-known water-ouzel, *C. aquaticus*. This interesting bird is frequent along the banks of rivers, but seems to prefer those of a somewhat rocky, alpine character. It lives in pairs, keeping always close by the stony margin of its chosen stream. The nest, according to Sir William Jardine, is formed exactly like that of our common wren, with a single entrance, and is composed of ordinary mosses, without much lining. It is usually placed beneath some projecting rock, not many yards above the water, "and often where a fall rushes over, in which situation the parent birds must dash through it to gain the nest, which they do with apparent facility, and even seem to enjoy it. At night they roost in similar situations, perched with the head under the wing, on some little projection, often so much leaning as to appear hanging with the back downwards. I recollect a bridge over a rapid stream, which used to be a favourite nightly retreat, under an arch; I have there seen four at a time sitting asleep in this manner, and used to take them with a light. Before settling for their nightly rest, they would sport in the pool beneath, chasing each other with their shrill and rapid cry, and at last suddenly mount to their perch; when disturbed, they return again in five minutes."¹ During winter they migrate to the lower streams; but in summer are most abundant on the alpine tributaries. They feed on small fish and insects, and are remarkable for their power of walking, with the assistance of their wings, beneath the surface. There is an American species (*C. Americanus*), of somewhat larger size, and of a uniform brownish slate colour. It extends along the range of the Rocky Mountains, from Mexico to Lake Athabasca. There is also an Asiatic species, figured by Mr Gould,² under the title of *C. Pallasii*, a name formerly bestowed on a bird supposed to come from the Crimea.

Mr Brehm has described another species by the name of black-bellied water-ouzel (*C. melanogaster*). It inha-

bited the north-eastern parts of the European continent, *Insessores.* visiting in severe winters the coasts of the Baltic, where it is neither shy in its habits, nor distrustful of the presence of man. We are rather inclined, however, to distrust some of Mr Brehm's species.

The genus *PHILEDON* of Cuvier has the bill slightly arched throughout its whole length, compressed, broadened at the base; the nostrils are large, protected by a cartilaginous scale, and the tongue terminates in a sort of tuft. Hence the species are by many classed among the honey-sucking or tenuirostral tribes. Many of them are remarkable for some particular garniture about the base of the bill, and are found in New Holland and the eastern islands. The genus is very extensive, but not very naturally composed, as it consists of species brought from a variety of other genera, such as *Certhia*, *Merops*, *Gracula*, *Sturnus*, &c. Some have a fleshy wattle depending from the lower mandible, as in *Phil. carunculatus* of New Holland (which forms the genus *CREADON* of Vieillot). In others the head is partially bare of feathers, as in the *goruk*, likewise a native of New Holland, a bold and restless bird, which feeds both on insects and honey, and often puts to flight whole droves of blue-bellied parakeets. Some have neither bare skin nor wattles, but are distinguished by a peculiar frizzled character of parts of the plumage. The bee-eater of Cook's voyage (*Phil. Cinnamatus*) is of this kind. It is a beautiful bird, of a glossy blackish green, with a band of white across the upper portion of the wing, and a pendent tuft of long, twisted, white feathers on each side of the neck. It is a native of New Zealand, and was formerly in great request, as contributing to ornament the feathered mantles worn by chiefs and persons of distinction. The species is also said to sing well, and is moreover highly esteemed as an article of food.

In the genus *EULABES*, Cuv. (*Mainatus*, Brisson; *Gracula*, Vieil.), the bill is strong, compressed, high, the culmen arched, the sides dilated towards the gape. A portion of the cheek is bare, and a fleshy appendage stretches towards the occiput from either eye. Here are placed the famous mina birds, of which two species seem to have been confounded by Linnæus under the title of *Gracula religiosa*. The specific name was first applied by misapprehension, in consequence of a Musulman woman refusing, on account of some religious scruple, to allow a European artist to make a drawing of one of these birds, which she had in captivity. Some uncertainty seems still to pervade the naming of the species. The Indian kind (*G. Indicus*, Cuv.) is somewhat larger than a blackbird, the plumage of a fine silky black, with a white spot upon the central edge of the wings, the bill and feet yellow. This bird is easily tamed, and becomes extremely familiar in confinement. It is probably the most accomplished linguist of all the feathered tribes, and may be taught to pronounce long sentences in the most clear and articulate manner. It is consequently held in high esteem, and is frequently brought alive to European countries, although it must be confessed that the purity of the English tongue is not always exhibited by the result of its maritime education. The food of the mina in a state of nature is said to consist both of fruits and insects. It greatly loves bananas, and in this country has no objection to either grapes or cherries. The larger species (*G. Javanus*, Cuv.) equals the size of a jay. See Plate CCCXCI. fig. 3. The bill is broader, more hooked at the end, but without the notch. Now M. Lesson gives the name of *Sumatranus* to this species, and

¹ Note to Wilson and Bonaparte's *American Ornithology*, vol. iii. p. 451.

² *Century of Birds from the Himalaya Mountains*.

Insessores. says that the Javanese, who esteem it highly, and part with it unwillingly, obtain it only by navigation. The Indian species he has named *Javanus*, but without assigning any special reason for such transmutations. The plumage is the same in both. Old Edwards seems long ago to have indicated the two kinds. "The greater minor," says he, "for bigness equals a jackdaw or magpie; the lesser hardly exceeds a blackbird, so that the one is at least twice as big as the other." The bird described by Bontius as an Indian starling was a mina. It imitated man's voice more accurately than a parrot, and "was oftentimes troublesome with its prattle."

In the genus *GRACULA*, Cuv. (*Pastor*, Temm.), the bill is compressed, straight, or but slightly arched, the notch feeble, and the commissures form an angle as in the starlings. This restricted genus contains several interesting species, such as the pagoda-thrush (*G. pagodarum*), so called from its frequent occurrence among the pagodas of Malabar and Coromandel. According to Sonnerat, it is often kept caged for the sake of its song. The paradise grackle of Latham (*Par. tristis*, Linn.) also pertains to this genus. It is well named *Gracula gryllivora* by Daudin, and is remarkable, as its name implies, for the destruction of locusts. We abridge the following particulars from Buffon. The island of Bourbon, where this species was formerly unknown, was once overrun to an alarming extent by locusts, which had been accidentally introduced from Madagascar. The governor-general and the intendant of the island, alarmed at the desolation which was taking place, deliberated on the best means of extirpation, and with that view they introduced several pairs of the so-called paradise grackle from India. The plan promised to be successful; but unfortunately some of the colonists observing the birds eagerly thrusting their bills into the soil of the newly-sown fields, imagined they were in quest of grain, and spread a report that the grackles, so far from proving beneficial, were likely to be highly detrimental to the country. The case was argued in due form. It was stated on the part of the grackles, that they ransacked the new-ploughed fields, not for grain, but insects; but the opposite view prevailed, and two hours after the edict of proscription passed, not a living individual was to be found in the island. A speedy repentance followed this intemperate and hasty execution, the locusts regained their ascendancy, and soon becoming more injurious than ever, the grackles were again introduced, after an absence of nearly eight years. Their preservation and extension now became an affair of state, laws were enacted in their favour, and the physicians (we presume, from policy) declared their flesh unwholesome. An opposite inconvenience, however, is said to have since arisen. The birds having prodigiously increased in numbers, and being no longer adequately sustained by insect food, have had recourse to grapes, dates, and mulberries, and have even proceeded to scratch up rice, maize, wheat, beans, and other useful produce; they enter pigeon-houses, and attack both eggs and young; and thus, after destroying the destroyer, they have themselves become a greater pestilence than that which they extirpated. There is perhaps some exaggeration in the concluding parts of this statement, as M. Duplessin, who resided several years in the island, states that the laws for its preservation are still in force. We may add, that this bird is of the same lively and imitative disposition as the mina, and is easily taught to speak. When kept near a farm-yard, or other place resorted to by different kinds of creatures, it spontaneously acquires the various cries of dogs, ducks, geese, sheep, pigs, and poultry. The manners of the genus in general resemble those of the starling. They fly in troops, searching for insect prey; their

habits are familiar, their docility remarkable, and their powers of imitation almost unparalleled. The only European species hitherto classed with the grackles is the beautiful rose-coloured ouzel (*P. roseus*), which occurs in several of the warmer countries of Asia and Africa, is not unfrequent in Spain and Italy, and shows itself in other parts of Europe, more rarely as we proceed northwards. Even in Tuscany and the Lombardo-Venetian territory it is esteemed unusual. A few are recorded to have built their nests in the Florentine district in 1739. We do not know that they have been since observed to breed in Europe. They were very common in Dalmatia in 1832; and in the year following one was shot in Ross-shire.

In the genus *PYRRHOCORAX*, Cuv. the bill is compressed, arched, rather slender, slightly notched, the nostrils covered with feathers. We have two European species, according to Temminck's views, viz. the alpine crow of Latham (*P. pyrrhocorax*), and our own red-legged crow (*P. graculus*). The former inhabits the highest of the Northern and Helvetian Alps, seldom showing itself during the summer season at any distance from the regions of perpetual snow; the latter is also mountainous, but more widely spread over countries of less elevation. It is not unfrequent along many of the rocky coasts of England and Wales, is frequent in the Isle of Man, and occurs occasionally along the western shores of Scotland, and in Colonsay and other islands. Baron Cuvier places this bird alongside the hoopoes, as a tenuirostral genus called *FREGILUS*.

In the genus *ORIOLES* the bill resembles that of the thrushes, but is more powerful. The legs are shorter, and the wings rather more lengthened. As now restricted, this genus contains only the species of the ancient continent, those of America (*Icterus*, *Cassicus*, &c.) being included among the conirostral tribes. The golden oriole (*Oriolus galbula*) is one of the most beautiful of European birds. It occurs occasionally in Britain. It breeds in many parts of the European continent, arriving in spring and departing in autumn. It builds on the tops of trees, its nest being attached to and partly suspended from a forked branch. This species feeds on fruits and insects, and is particularly fond of figs. The Italian peasants suppose its cry to signify "Contadino, é maturo lo fico?" Its own flesh is of most excellent flavour, especially in autumn, when having for a time fared sumptuously on the best of fruits, it has become extremely fat. The rich plumaged regent bird of New South Wales (*Sericulus chryscephalus*, Swainson) is by some regarded as an oriole.

The genus *GYMNOPS*, Cuv. possesses the strong bill of the orioles, but a great part of the head is bare of feathers. In some of the species there is a prominence on the base of the beak. Such are the knob-fronted bee-eater of White (*Merops corniculatus*), figured by Vaillant under the name of corbicalao (*Ois. d'Amérique et des Indes*, pl. 24), and the cowled bee-eater (*Merops monachus*, Latham). The tongue is said to be tufted like that of *Philedon*. To the genus *Gymnops* Cuvier also refers the bald grackle (*G. calva*, Linn. and Lath.), a remarkable species, native to the Philippine Islands, where it is said to build in the hollows of the cocoa-nut tree. It feeds on fruits, and is extremely voracious.

In the genus *MENURA*, Shaw, the bill is straight, somewhat triangular at the base, compressed, the nostrils lengthened, central. Region of the eyes bare. Feet large and strong. The only known species of this singular and somewhat anomalous genus, the lyre-tail of New Holland (*M. lyra* or *superba*), is characterized by the great extension and peculiar structure of the tail-feathers. (See Plate CCCXCI. fig. 4.) It is equal in size to a pheasant.

Insectores. The general plumage is brown. The tail of the female is of the ordinary structure. This bird inhabits rocky districts. Though placed in its present station by Cuvier, it certainly seems more allied to the gallinaceous than the passerine order. Its history, however, is still obscure, and its anatomical structure, we believe, has not yet been investigated.

From the last-named genus, it would appear an abrupt and bold transition to the feeble-bodied, soft-billed stone-chats, warblers, wagtails, and other *Sylviadæ*, all of which, however, Baron Cuvier has here grouped as intermediate between *Menura* and *Pipra*. They form a very numerous assemblage, all characterized by a rather straight and slender bill, but varying, on the one hand, by the depression of the mandibles, towards the fly-catchers, and on the other, by its compression and curvature, towards the straight-billed butcher-birds. The *Sylviadæ* or warblers are divided by Mr Swainson into the five following sub-families, viz. 1st, *Saxicolinæ* or stone-chats, in which the bill is depressed at the base, the gape furnished with diverging bristles, the feet lengthened, the tail rather short, the head large; 2d, *Philomelinæ* or nightingales, in which the general structure is larger and more robust than in the typical warblers, and the feet more formed for perching; 3d, *Sylvianæ* or true warblers, of which the size is very small, the structure weak, the bill very slender, straight, with the under mandible much thinner than the upper; 4th, *Parianæ* or tit-mice (placed by Cuvier in the conirostral tribe), in which the bill is either entire or very slightly notched, and more or less conic, the hind toe large and strong, and the lateral toes unequal; 5th, *Motacillinæ* or wagtails, in which the bill is lengthened, straight, and slender, the legs long, and formed for walking, the hind toe elongated, and the tail narrow and lengthened.¹ Mr Swainson has elsewhere remarked, that the *Sylviadæ* might be termed "ambulating fly-catchers," since, when viewed collectively, they are only separated from the *Muscicapinæ* by a different mode of feeding, indicated by the superior length and structure of their feet,—these parts being adapted for constant locomotion, either among branches or upon the ground; while in the true fly-catchers the feet are short, small, and feeble, in accordance with the sedentary habits of the species. "Comparing the warblers, on the other hand, with the thrushes, we see that the best distinction between the two groups lies in the very character which assimilates the *Sylviadæ* to the fly-catchers, namely, the basal depression of the bill. We allude, of course, to typical examples; since all these distinctions are softened down, in proportion as the three groups approximate.² We shall now proceed with our exposition of Baron Cuvier's system.

The genus *SAXICOLA*, Bechstein, has the bill slightly depressed and broadened at the base. The species of this genus seem confined to the ancient continents and New Holland. They feed on insects, build on the ground or among heaps of stones, and usually frequent rather wild and barren places. We have three British species, the wheat-ear or white-rump (*S. ænanthe*), which is migratory, and arrives with us in early spring, frequenting commons and mountain pastures, but also occurring in more cultivated places, though always preferring open districts; the whin-chat (*S. rubetra*), likewise migratory, but later in its arrival, and frequenting moorlands and commons covered with furze or low brushwood, where it is almost always seen to alight upon the topmost spray; and the stone-chat (*S. rubicola*), which resides in Britain throughout the year, and is often found in moistish places. Of these the white-rump is the most esteemed as food, being compared by many to the ortolan. It is much sought after in Italy, that "land

of song," where, by the strangest mal-association, a man no sooner hears a feathered warbler sing than he desires to shoot and eat it. Even in the southern parts of Britain it is much esteemed; and Pennant tells us, that as many as 1840 dozen have been taken in a single season at East Bourne, in Essex. In the south of Europe it is usually captured by means of a peculiar net, and the lure of a living owl; with us a noose of horse-hair placed between two upraised or inclined portions of turf, between which the bird attempts to pass in search of insects, is found sufficient. In regard to the stone-chat, Temminck mentions that, though stationary in Africa, in Europe they are birds of passage. It is singular in this case that they should remain throughout the year in Britain. The fact that they do so, however, is undoubted, as we have ourselves shot them on the Pentland Hills when the ground was covered with snow. Signor Savi mentions that they are stationary in Tuscany, although "per il tempo del caldo maggiore dell' estate, e dell' autunno, molti abbandonano le pianure, e si ritirano sù i monti per cercare luoghi più freschi."³

In the genus *SYLVIA* of Wolf and Meyer (*Ficedula*, Bech.) the bill is merely a little narrower at the base than in the preceding. The generic title, however, has been variously applied of late, by different writers, to their restricted groups.—Mr Selby using it to designate our willow and wood wrens, while Cuvier makes it contain, among others, the four following British species, viz. the red-breast (*S. rubecula*), the blue-throat (*S. suecica*), the common red-start (*S. phænicurus*), and the black red-start (*S. tithys*). Of these, the second and fourth can scarcely be regarded as otherwise than of accidental occurrence in England, and have never been seen in the northern quarters of the island. The red-breast is perhaps the most beloved of British birds, and is remarkable for its combination of familiarity and independence. When left to its "own sweet will," it enters houses freely in cold or snowy weather, will perch night after night on corniced book-case, or seek repose upon the golden scallop of a picture frame; but it hates all forwardness in others, and will not voluntarily come in contact with any hand, however beautiful. It hops delighted, singing as it goes with low and plaintive note, along the comfortable carpet, or darting up suddenly towards the window-frame, will utter a louder gush of angrier melody on seeing some orange-breasted brother, perched on leafless spray, still braving the increasing darkness. For a time, just before nightfall, he seems himself to suffer from some uneasy instinct, or probably desires, from habit, to secure his usual perch in old fantastic yew or thick screened holly; but, on second thoughts, he soon assumes some quiet corner, above the reach of curious children's hands. Not seldom when the evening fire burns brightest, he descends on muffled wing, his large and liquid eye dilated less with fear than quiet wonder, and after a brief survey, he re-ascends his place of safety. Although this bird remains about our doors throughout the summer, building near out-houses and in orchards, yet

Some red-breasts love amid the deepest groves
Retired to pass the summer days. Their song
Among the birchen boughs, with sweetest fall
Is warbled, pausing,—then resumed more sweet,
More sad, that to an ear grown fanciful,
The babes, the wood, the men, rise in review,
And robin still repeats the tragic line.

We have a notion, that in Scotland the female red-breast is migratory. At least, in the vicinity of Edinburgh, we recognise her not throughout the long-enduring winter. All the individuals then about our gardens sing and fight, till, in the month of March, some strangers show themselves, but do not sing, and are immediately followed and

¹ Nat. Hist. and Classif. of Birds, ii. 238.

² Fauna Boreali-Americana, part ii. p. 20.

³ Ornitologia Toscana, i. 231.

Insectores. fed by the resident males, at which time they (the supposed females) utter a low hissing note, and flutter their wings like young dependent birds. This we have often seen, and vouch for.

The red-start is a rarer species. It haunts retired well-wooded lanes, where the timber is in a better state than the stone dikes; for it highly approves of the latter when old, moss-covered, and full of holes. It is a bird of passage, and although greatly less familiar than the red-breast, we have seen it build beneath the cottage eaves. It is an active, restless bird, easily recognised by its snow-white forehead, black throat, ashy back, and fine reddish orange breast and rump, to say nothing of the constant vibratory motion of the tail.

The blue bird of America (*Sylvia sialis*) has the whole of the upper plumage of a fine blue, while the throat, neck, breast, and flanks, are bright orange brown. In general character and movement this bird resembles the European red-breast, and may be said to be as familiarly known in summer to the children of America as the robin is to ourselves. Wilson informs us that its society is much courted by the inhabitants of the country, and that few farmers neglect to provide for him a snug little summer-house, ready fitted, and rent free. He is migratory over the northern districts, but a few remain throughout the winter in some parts of the United States. A more recently described species, nearly allied to the preceding, was procured by Dr Richardson at Fort Franklin, and is named by Mr Swainson *Erythaca arctica*. Its colour is a fine ultra-marine blue above, beneath greenish blue, whitish on the lower part of the abdomen, and under tail-coverts. It seemed to be merely a summer visitant of the fur-countries, and no other knowledge of its haunts or habits has been yet obtained.

The genus CURRUCA, Bechstein, has the bill straight, slender throughout, a little compressed anteriorly, the upper mandible slightly curved towards the point. It contains that prince of European songsters, the nightingale (*C. luscinia*), a bird of shy and unobtrusive disposition, seldom seen in open places, but loving the protection of a close entangled undergrowth of brakes and bushes. Its powers of song are generally admitted to be unrivalled, although the effect is no doubt enhanced by the solemn stillness of the summer night, when every other voice has sunk to rest,—for then

The wakeful bird
Sings darkling, and in shadiest covert hid
Tunes her nocturnal notes.

The words of the divine Milton are sacred; yet we know not that the female sings. It is a curious coincidence, however, that she should be asserted so to do by Pliny. Our British nightingales never venture farther north than Doncaster, although in Sweden and the northern parts of Germany they are less restricted in their summer movements. To this genus belong several other excellent British songsters, such as the rich-voiced black-cap (*C. atricapilla*), the greater petty-chaps (*C. hortensis*), and the white-throat or muggy (*C. cinerea*). These, as well as the following, are called abroad *fauvettes*.

A few species which affect damp underwood and reedy marshes, such as the grasshopper warbler (*S. locustella*), the sedge-warbler (*S. phragmitis*), and the reed-wren (*S. arundinacea*), constitute the genus SALICARIA of Mr Selby. To the same little group, we doubt not, belongs the *beccamoschino* of the Tuscans (*Sylvia cisticola*, Temm.), remarkable as exhibiting the propensities of a tailor-bird. The nest is placed near, but not upon the ground, usually in a bush of lengthened herbage, the leaves and stalks which

form the external covering being drawn together, while a *Insectores* flooring for the nest is made somewhat lower down, by curving the leaves across. The beauty of the structure consists in this, that the latter are not supported by their mutual interlacement, but are sewed together, sometimes by spiders' webs, sometimes by thread-like portions of various plants. The interior is chiefly composed of vegetable down. The nests constructed in April are much less finished than those of August, owing to the absence, in the earlier month, of several materials which greatly conduce towards their elegance and solidity.¹

Another limited genus, called ACCENTOR, has the bill also slender, but rather more conical than the other *Sylvia*, with the edges slightly bent inwards. The species are much more hardy than the preceding (all of which are birds of passage); and our only British representative, commonly called the hedge-sparrow (*A. modularis*), remains with us throughout the winter. It seems characteristic of the northern parts of Europe, being seldom seen in France except during winter; and the few that occur in Italy are known to breed among the mountains, only descending to the plains when the summer heat is over. With us what school-boy knows not its mossy, twig-entangled nest, and pure unspotted eggs of greenish blue? A larger and still hardier species is the alpine warbler (*A. alpinus*), of the accidental occurrence of which in the garden of King's College, Cambridge, an instance is recorded by Mr Selby. This bird is an inhabitant of the most mountainous regions of Europe, and particularly affects those districts which are of an abrupt and rocky character. It is common among the Alps of Switzerland, and may be usually seen in the environs of the convent of St Bernard. In summer it ascends to a great elevation, where it breeds beneath the ledges of the rocks, laying four or five eggs of a greenish-blue colour. As winter advances, and the snow begins to gather amid the desolate steeps, it descends towards the vales and middle regions of the mountains, where it subsists upon the seeds of alpine grasses, and of other plants. In summer it destroys grasshoppers, and various insects, and their larvæ.²

In the genus REGULUS, Cuv., the bill is still slender, but conical, sharp pointed, and the sides, when viewed from above, are slightly concave. The species are much more active and arboreal than those last named. We may mention as an example our beautiful golden-crested wren (*R. auricapillus*, Selby; *Mot. regulus*, Linn.), the smallest of British birds. It inhabits woods and forests, and flits rapidly from tree to tree, examining the leaves and branches in search of insects. Its manners resemble those of the tit-mice, in company with which it often travels. Mr Selby has recorded, that after a severe gale from the north-east, thousands of these tiny creatures were seen to arrive upon the sea-shore and sand-banks of the Northumbrian coast,—many of them so fatigued as to be unable to rise again after alighting on the ground. In this genus Cuvier retains our willow or yellow wren, and lesser petty-chaps (*M. trochilus* and *hippolais*), which most other modern writers keep apart in their restricted genus *Sylvia*, bestowing other titles (*Erythaca*, *Phanicura*, *Philomela*, &c.) on the genus which Cuvier has so called. These transpositions are the bane of Ornithology. Several true *Reguli* inhabit North America.

Our common (kitty) wren forms, with certain foreign species, the genus TROGLODYTES of Cuv. The bill is rather more slender than in *Regulus*, and slightly arched.

The generic name of MOTACILLA, of such extensive application in the older systems, is now restricted to the wag-tails, such as *M. alba* and *cinerea*, Linn. Our yellow

¹ *Nuovo Giorn. de' Letterati*, t. vi. (where the nest is figured); and *Ornitologia Toscana*, t. i. p. 282.

² *Illustrations of British Ornithology*, vol. i. p. 247.

Insectores. species, which differs from the others in being a bird of passage, is moreover distinguished by an arched and lengthened hind claw, and forms the genus *BUDYTES*, Cuv., founded, perhaps, upon a character of no great importance. All the wag-tails are peculiar to the ancient continent.

The genus *ANTHUS*, Bechstein, so long united to the true larks, has the bill straight, slender, rather subulate towards the point, the base of the upper mandible carinated, the tip slightly bent, and emarginated. The hind claw is more or less produced. We have three British species, the rock or shore pipit (*A. aquaticus*), the tit-lark or meadow pipit (*A. pratensis*), and the tree pipit (*A. arboreus*). Richard's pipit (*A. Richardi*, Vieil.) may be included in our list of accidental visitants.

The great tribe of *Dentirostres* is terminated by Cuvier with certain groups which differ from all the preceding by the closer union of the outer and middle toes, which are joined together for a considerable space, after the manner of the syndactylous tribes.

Of these groups the first is composed chiefly of the *manakins* (Genus *PIPPA*, Linn.), in which the bill is short, compressed, higher than broad, notched, the nasal fossæ large, the nostrils concealed by feathers. The tail and legs are short. They may be subdivided as follows.

In the genus *RUPICOLA* of Brisson the species are of considerable size, and their heads are ornamented by a double crest of vertical feathers. The only species known are South American, and are distinguished by the name of rock manakins. *P. aurantia*, Vieil. (*Pippa rupicola*, Gm.), is of a brilliant orange colour, with peculiar frizzled feathers on the wings and tail. It is one of the most beautiful of birds, lives on fruits, scrapes in the ground like the Gallinæ, and constructs its nest among the deep caverns of the rocks. It is shy and mistrustful, and flies with great rapidity. The female, which is of a brown colour, lays two eggs of the size of those of a pigeon. The immature birds are also brown. This species inhabits the rocks by the rivers of Guiana. Not far from the banks of the river Oyapoc, to the windward of Cayenne, is a mountain which contains an immense cavern. There also, according to Waterton, the cock of the rock is plentiful. He is of a gloomy disposition, retiring during the day among the darkest rocks, and only coming out to feed a little before sunrise and at sunset. The South American Spaniards call him *Gallo del Rio Negro*, supposing that he is only met with in the vicinity of that far inland stream; but he is common in the interior of Demerara, amongst the huge rocks in the forests of Macoushia, and has been shot south of the line, in the captainship of Para. *R. Peruviana* is a nearly allied species, of somewhat larger size, but wanting the frizzled character of the wing and tail feathers. It inhabits Peru. The female is still unknown. Our author here places the beautiful green species from Java and Sumatra (*Calyptomena viridis* of Horsfield), which he thinks differs from the other *Rupicolæ* chiefly in the crest not being fan-shaped. (See Plate CCCXCI. fig. 7.) The true manakins (genus *PIPPA*, Cuv.) are of much smaller size. They likewise inhabit America, where they dwell in the deep and humid forests, feeding, it is said, both on fruits and insects. They are in general distinguished by the rich and varied colouring of their plumage. We have figured as an example a beautiful Brazilian species, the *Pippa pareola*. (See Plate CCCXCI. fig. 5.)

The terminal group of the *Dentirostres* is formed by the genus *EURYLAIMUS*, Horsfield, in which the bill is much stronger and broader than in any of the preceding, being in some of the species so greatly depressed and expanded at the base, as to exceed the breadth of the head. The upper overlaps the under mandible. These birds are peculiar to India and the great eastern islands, and now amount to five or six in number, which, however, offer such

disparity in the structure of the bill, as to render subdivision unavoidable. This has been in part effected; the genus *CYMBIRHYNCHUS*, Vigors, containing *Eu. nasutus*, while the specific name of another (*Eu. corydon*), remarkable for the extraordinary expansion of the upper mandible, is used generically by M. Lesson, the species itself being termed *Temminckii*. (See Plate CCCXCI. fig. 8.) We know little of the manners of any of these birds. When actually ascertained, they may probably be found to offer a considerable disresemblance. They have hitherto been generally found in wild and desert places, by the banks of rivers, and are supposed to feed both on fruits and insects, — a frequent, if not a safe conclusion on the part of naturalists, regarding almost every unknown species which happens to be neither a goose nor an eagle.

TRIBE 2D.—FISSIROSTRES.

This restricted tribe consists of the swallows, swifts, and goat-suckers, and is characterized by the bill being short, broad, depressed, slightly curved, without any tooth, and so deeply cleft as to give peculiar wideness to the gape, — a structure of great use to birds which prey so exclusively on insects taken on the wing. Their insectivorous regimen induces migratorial habits, and all the species leave ourselves and other northern nations so soon as the sear and yellow leaves of autumn betoken the approach of frost, and the consequent decrease or extirpation of insect life. Like the raptorial order, or birds of prey properly so called, the fissirostral tribe is capable of a binary division into diurnal and nocturnal species.

Swallows, in general (*HIRUNDO*, Linn.), are remarkable for their close-set, usually glossy plumage, the great length of their wings, their swift, powerful, easy, and long-continued flight. They occur in almost every region of the globe. In the restricted genus *HIRUNDO*, Cuv., the toes are disposed as in the majority of birds, that is, three anterior and one posterior. In some of the species the legs and feet are clothed with feathers; the hind claw is slightly disposed to turn forwards, the tail is forked, and of medium size. Such is our martin or window-swallow (*H. urbana*) which forms so cheerful a feature in many of our villages and country dwellings, building beneath the eaves of houses, or the upper angles of windows. It is glossy bluish-black above, the rump and all the lower regions white. In others the legs and feet are naked, the tail forked, and of great length. Such is our chimney-swallow (*H. rustica*), which usually builds in out-houses, and leaves the top of its nest uncovered. Its upper parts, and the higher portion of the breast, are black; the forehead and throat deep orange-brown, the lower portions of the body white. This species usually appears a few days earlier in April than the preceding. Although the migratory movements of both these birds may be still regarded as mysterious, there is now no doubt of the fact that they do migrate. It appears from the observations of M. Natterer, that they moult in February, that is, during their absence from this, the land of their nativity, — a fact which would of itself suffice to overthrow the idea of their long-protracted winter sleep. It is also in respect to other purposes as usual well ordained, for if the heavy moult which befalls so many species during spring or autumn, were equally to affect these long-winged birds, their flight from foreign lands, or journey thither, might be procrastinated, or prevented altogether. Swallows are probably the most purely and exclusively insectivorous of all birds, and even if they could themselves withstand our winter's cold, they would soon perish miserably from want of food.

This extreme sensibility of course renders it difficult to keep swallows caged, or otherwise confined, throughout the winter season. Yet several instances are known

Insectores. of their surviving that inclement period. The following is given by Mr Bewick, on the authority of the late Sir John Trevelyan. The experiments were made by a Mr Pearson. "Five or six of these birds were taken about the latter end of August 1784, in a bat-fowling net, at night; they were put separately into small cages, and fed with nightingale's food. In about a week or ten days they took the food of themselves: they were then put altogether into a deep cage, four feet long, with gravel at the bottom; a broad shallow pan with water was placed in it, in which they sometimes washed themselves, and seemed much strengthened by it. One day Mr Pearson observed that they went into the water with unusual eagerness, hurrying in and out again repeatedly with such swiftness as if they had been suddenly seized with a frenzy. Being anxious to see the result, he left them to themselves about half an hour, and on going to the cage again found them all huddled together in a corner apparently dead; the cage was then placed at a proper distance from the fire, when two of them only recovered, and were as healthy as before—the rest died; the two remaining ones were allowed to wash themselves occasionally for a short time only; but their feet soon after became swelled and inflamed, which was attributed to their perching, and they died about Christmas. Thus the first year's experiments were in some measure lost. Not discouraged by the failure of this, Mr Pearson determined to make a second trial the succeeding year, from a strong desire of being convinced of the truth respecting their going into a state of torpidity. Accordingly, the next season having taken some more birds, he put them into the cage, and in every respect pursued the same methods as with the last; but to guard their feet from the bad effects of the damp and cold, he covered the perches with flannel, and had the pleasure to observe that the birds thrived extremely well. They sang their song through the winter, and soon after Christmas began to moult, which they got through without any difficulty, and lived three or four years, regularly moulting every year at the usual time. On the renewal of their feathers, it appeared that their tails were forked exactly the same as in those birds which return hither in the spring, and in every respect their appearance was the same. These birds were exhibited to the Society for promoting Natural History, on the 14th February 1786, at the time when they were in a deep moult, during a severe frost, when the snow was on the ground. They died at last in the summer, from neglect during a long illness which Mr Pearson had, who concludes this interesting account with the following words: 'January 20, 1797.—I have now in my house, No. 21 Great Newport Street, Long-Acre, four swallows in moult, in as perfect health as any birds ever appeared to be in when moulting.'"¹ Our only other species is the sand-swallow, or bank-martin (*H. riparia*), of smaller size and browner colour. It is the earliest of the genus; but being more locally distributed, its arrival in many districts is not so speedily observed.

Among the foreign species, one of the most remarkable is *H. esculenta*, a small brown swallow, from the Indian Archipelago. Its nest, formed chiefly of a peculiar kind of sea-weed, is very mucilaginous when cooked; and its restorative virtues are held in such high esteem, that it has become with eastern nations, especially the Chinese, a most important article of commerce. The best kinds (such as are white and transparent, and of a uniform and delicate texture) sell at from a thousand to fifteen hundred dollars the peckul (not more than twenty-five pounds). The Dutch alone were in use to export from Batavia about a

thousand peckuls every year; but of these, a great proportion was brought from the islands of Cochin-China, and others to the eastward. However, these nests are nowhere more abundant than about Croee, near the south end of Sumatra. They weigh each about half an ounce, and resemble a small saucer in shape, with one side flattened, by which they adhere to the rocky walls of caverns. Their texture resembles that of isinglass, or fine gum-dragon. When about to be used they are soaked, then pulled to pieces; and after being mixed with ginseng, are put into the body of a fowl, which is stewed all night with a sufficient quantity of water. When dissolved in broth they are said to give it a delicious flavour.² Naturalists are not agreed as to the exact mode of formation of these nests. Some suppose them the result of a glandular secretion. Alexander Wilson says, that the aculeated swallow (*H. pelagica*) of America fastens together the twigs which compose its nest by means of a strongly adhesive gummy matter, secreted by two glands placed on each side of the hinder portion of the head.³

The swifts belong to the genus *CYPSELUS* of Illiger, distinguished by the extreme shortness of the legs, and the peculiar character of all the four toes being directed forwards. The middle and outer toes have only three articulations. Of all the feathered race, these are perhaps the most vigorous and unwearied flyers. Even in the skeleton, the shortness of the humerus, the breadth of its apophyses, the oval form of the fourchette, and the sternum unnotched below, indicate a structure admirably suited to sustain aerial motion; and when to these we add the enormously lengthened primary feathers of the wings, we have a flying machine of the most powerful kind. We doubt not that during every summer evening in which these sable creatures pursue their gladsome gambols through the unresisting air, they travel many hundred miles. It is easy to observe, that they are often on the wing incessantly for hours together, careering in fine weather in vast and intersecting circles, screaming after each other in no melodious strains, and flying at such a maddening rate as if flight were the only faculty worthy of exercise in earth or heaven; and we are sure that the same genius for arithmetic which enables a school-boy to ascertain how many grains of barley would surround the world, might, if applied to every minute's flight of this surprising bird for one "purpureal eve," elicit a result in distance which would astonish even a railway engineer. Our common swift is the *Cypselus murarius* of Temm. (*Hirundo apus*, Linn.). These birds, as well as swallows, seem in many instances to return to the same spot for a series of years. Dr Jenner took two claws from the foot of twelve swifts. Several were re-taken in the course of one or two seasons; and at the expiration of seven years, one was brought in by a cat. A larger species (*C. alpinus*, Temm.), frequent among the Alps of Switzerland and the Tyrol, and well known at Gibraltar, has occurred occasionally in Ireland. There are a great many foreign species, both of swifts and swallows.

In the genus *CAPRIMULGUS*, Linn., the gape is still wider, and the beak is bristled at the base with stiffish hairs. The wings are very long, the legs short, the tarsi usually feathered, the toes united at the base by a membrane, slightly connecting even the hinder toe, which is somewhat versatile; the middle toe is often toothed on its inner edge (see Plate CCCXCI. fig. 6 a); and the outer one, by a conformation of rare occurrence amongst birds, has only four articulations.

The Caprimulgi or goat-suckers (an absurd and fabu-

¹ Bewick's *British Birds*, i. 254.

² See Shaw's *General Zoology*, vol. x. p. 111; and Sir G. Staunton's *Embassy to China*, vol. i. p. 288, and vol. ii. p. 5. This species seems described under the name of *H. fuciphaga*, in *Act. Holm.* t. xxxiii. p. 151.

³ *American Ornithology*, vol. ii. p. 24.

Insectivores. lous term, which, however, serves the best purpose of a name, in being generally understood to relate to the species in question) are solitary birds, which feed voraciously on insects, and fly about during the evening twilight, encroaching in mid-summer on the clear and stilly hours of night. Our only British species (*C. Europæus*) is a bird of passage; and in its beautifully brindled plumage of ashy-gray, brown, and black, with here and there a patch of white, presents a characteristic example of the genus. It frequents commons, heaths, and uncultivated tracts, especially where interspersed with brushwood. When on the wing, it utters occasionally a sharp hawk-like cry; but Cuvier surely errs when he asserts that "l'air qui s'engouffre, quand ils volent, dans leur large bec, y produit un bourdonnement particulier." If he alludes to the peculiar purring and prolonged sound which some compare to that of a spinning-wheel, there is no doubt of its being produced when the bird is at rest, on the top of a wall, or among a heap of stones. When perched upon a branch or paling, its position is peculiar. It rests horizontally in the same direction as that by which it is supported, instead of across or at right angles. Its flight, when pursuing moths and beetles, is very easy and graceful. The species of this genus are widely distributed. Three occur in North America; several in the southern parts of the new world; in New Holland they are well known; Africa produces some remarkable kinds; and those of Java and the East have been described by recent naturalists. Out of these, however, several subordinate genera have been created. The strong-billed species, which want the membrane between the toes, and the dentation of the middle claw, form the genus *PODARGUS*. They are natives of New Holland and the eastern islands. (See Plate CCCXCI. fig. 6.) The great species from Guiana, which has the sides of the upper mandible dilated into a blunt tooth, constitutes the genus *NYCTIBIUS* of Vieillot. A very peculiar species (*Guacharo de caripe*), which feeds on fruits, and dwells gregariously in caverns, where the young are much sought after on account of their delicious fat, forms the genus *STEATORNIS* of Humboldt.¹ It is the only frugivorous night-flying bird with which we are acquainted.

Although the general title of goat-sucker is so familiar to our ears, we confess we were never aware of how it had originated,—deeming it some accidental and unmeaning application,—till we had read the following passage in Mr Waterton's work. "When the moon shines bright, you may have a fair opportunity of examining the goat-sucker. You will see it close by the cows, goats, and sheep, jumping up every now and then under their bellies. Approach a little nearer,—he is not shy,—he fears no danger, for he knows no sin." See how the nocturnal flies are tormenting the herd, and with what dexterity he springs up and catches them, as fast as they alight on the belly, legs, and udder of the animals. Observe how quietly they stand, and how sensible they seem of his good offices; for they neither strike at him, nor hit him with their tail, nor tread on him, nor try to drive him away as an uncivil intruder. Were you to dissect him, and inspect his stomach, you would find no milk there. It is full of the flies which have been annoying the herd."² Many an hour, during the long still summer evenings, have we watched the flight of our only British species, while it hawked for moths along the fringed margins of the rocky woods, or glanced more openly across the dewy meadows which bank the crystal basin of the "beautiful Winander,"—but we never saw it hovering around or near to any kind of cattle. We doubt not, however, that the same habit, as noted by Mr Waterton, must

have been observed in Europe, and has, through misconception, originated the vernacular name.

TRIBE 3D.—CONIROSTRES.

In this tribe are comprehended a considerable variety of genera, exhibiting not a little disparity in size, structure, and habits, but agreeing in their bills being comparatively strong, more or less conical, and without notch. Several of the species, such as crows and magpies, are omnivorous; but, generally speaking, when compared with either of the two preceding tribes, the diet of the Conirostres may be termed granivorous.

The first little group is constituted by the larks, genus *ALAUDA*, Linn., of which the greater number have the bill straight, moderately thick, and pointed. (See Plate CCCXCII. fig. 1.) Though their flight is occasionally lofty and sustained, and the sky-lark (*A. arvensis*) obtains its name

From warbling high
His trembling thrilling ecstasy,
As, lessening from the dazzled sight,
He melts in air and liquid light,—

yet they haunt, and build their humble nests, habitually in fields of grain or grassy meadows. Even the wood-lark (*A. arborea*), although it perches and sometimes sings on trees, rears its young upon the ground. The shore-lark of Pennant (*A. alpestris*, Gmel.) is common to the northern parts of Europe, Asia, and America.

In the genus *PARUS*, Linn., the bill is small, short, conical, straight, beset at the base with hairs, and the nostrils concealed by feathers. The species commonly called *titmice* are lively, active little birds, usually observed flying with eagerness from tree to tree in search of insects, scaling the branches in all directions, and seemingly quite regardless whether their heads or their heels are uppermost. Their nests are usually placed under cover, either in the crevice of a wall or the hollow of an old tree, and the number of eggs which they lay exceeds that of most *Paseres*. They eat grain and seeds, as well as insects. The species are distributed over the whole world, with the exception of New Holland, South America, and the islands of the South Pacific Ocean. Although of rather gay and beautiful plumage, they are more numerous in temperate and northern countries than between the tropics. We have seven species in Britain, of which the bearded titmouse (*P. biarmicus*) is scarce, and partially distributed, and the crested species (*P. cristatus*) so extremely rare as to be regarded as accidental. From the small size, rapid movements, and usually arboreal habits of all these birds, their doings can scarcely be observed with advantage during the umbrageous summer. But when the woods have either lost their leafy glory, or the dry red foliage hangs unresistant of the slightest breath, then are these vivacious creatures seen to congregate in little flocks, sometimes several species joining together, and cheering each other on with frequent shrilly cries. In their foraging excursions they likewise visit our gardens, shrubberies, and cottage doors, plundering the farm-yards, eating potatoes with the pigs and poultry, and greedily searching out an old marrow-bone, or (if in Scotland) a sheep's head of the preceding Sunday. The suspended nests of some of the foreign species are extremely elegant, and even that of our own long-tailed species is an object of great interest and beauty. Mr Selby describes it as usually fixed in one of the smaller forks of a tree branch, but occasionally amid the closer screen of a fir, or the centre of a thick bush of woodbine or thorn. It is of a longish oval form, composed of different

¹ Acad. des Sciences, Mars 1817, Nouv. Bull. 1817, p. 51.

² Wanderings in South America, p. 143.

Insectores. lichens and wool firmly and curiously interwoven, and lined with a profusion of feathers. A small hole is left on two opposite sides of the nest, not only for ingress and egress, but also to prevent the bird during incubation from being incommoded by its long tail, which then projects through one of the orifices. The eggs are white, with fine reddish-brown specks upon the larger end, and usually amount to ten or twelve.¹ The *Parus pendulinus*, a species of the southern parts of Europe, constructs a purse-shaped dwelling, suspended from the flexible branches of aquatic plants, or interlaced among the waving reeds. This hang-nest tit-mouse is often seen among the marshes of Bologna, where the peasantry seem to regard it with the same kindly affection as we do our red-breast.

The genus *EMBERIZA*, Linn., is distinctly characterized by its rather short, straight, conical bill, and the curved form of the gape, produced by a narrowing of the sides of the upper mandible, and a corresponding enlargement of the under one. Instead of being as usual concave within, the upper mandible has a hard, rounded knob in the inside, or what is called a tuberculous palate. The species commonly known by the name of buntings feed chiefly on seeds and grain. The ortolan (*E. hortulana*), a native of the central and southern provinces of Europe, has been occasionally killed in England. It is much esteemed in Italy and elsewhere as an article of food. It is frequently lean when first netted; but if left undisturbed and well fed, it will not only fatten rapidly, but even in many instances die of repletion. The snow-bunting, and a few other kinds, distinguished chiefly by the elongation of the hind claw, form the genus *Plectrophanes* of Meyer, now called lark-buntings by our English writers.

The great genus *FRINGILLA* of Linn. has the bill also conical, and more or less thickened at the base; but the commissure is not angularly curved, as in the preceding group. Numerous subdivisions have been made of this genus in modern times. Of these the following may be taken as examples.

In *PLOCEUS*, Cuv., the bill is rather square at the base, but sharp-pointed; the upper mandible somewhat dilated. The species are known by the name of weavers, on account of the art with which they join together the materials of their nests. Several species are gregarious, even during the breeding season, hanging their nests close together in the same tree; and as each on building a new nest forms it in close connection with the old, the final result is, that an apparently solid mass is at length collected, consisting of numerous apartments, each tenanted by a pair of birds, but having the external appearance of one gigantic dwelling. Cuvier here places the species known in the older systems as the Philippine gross-beak, *Loxia Philippina*, Linn. This bird is known in India by the name of baya, and may be rendered so tame as not only to perch upon the hand, but to fetch and carry at command. It builds a very curious nest, in the shape of a long cylinder, swelling out into a globose form in the middle, and composed of the fine fibres of leaves and grass, fastened by the end to a lofty branch, generally of the Palmyra or Indian fig-tree. The eggs are said to resemble pearls, with the white part transparent even when boiled, and are accounted delicious eating. This species is alleged to feed on fire-flies. Another remarkable *Ploceus* is the sociable gross-beak, or republican, *Loxia socia*, Latham. It is an inhabitant of the interior of the Cape country, and is thus described in Paterson's *Travels*: "Few species of birds live together in such large societies, or have such an extraordinary mode of nidification, as these; they build their nests on the mimosa trees, which grow to

a very large size, and appear to be well calculated for the purpose, as the smoothness of their trunks prevents the birds from being attacked by monkeys, and other noxious animals. The method in which their nests are made is very curious. On one tree there could not be less than from eight hundred to a thousand under one general roof. I call it a roof, because it resembles that of a thatched house, and projects over the entrance of the nest below in a very singular manner. The industry of these birds seems almost equal to that of the bee. Throughout the day they appear to be busily employed in carrying a fine species of grass, which is the principal material they employ for the purpose of erecting this extraordinary work, as well as for additions and repairs. Though my short stay in the country was not sufficient to satisfy me by ocular proof that they added to their nest as they annually increased in numbers; still, from the many trees which I have seen borne down by the weight, and others which I have observed with their boughs completely covered over, it would appear that this is really the case. When the tree which is the support of this aerial city is obliged to give way to the increase of weight, it is obvious that they are no longer protected, and are under the necessity of rebuilding in other trees. One of these deserted nests I had the curiosity to break down, to inform myself of the internal structure of it, and found it equally ingenious with that of the external. There are many entrances, each of which forms a regular street, with nests on both sides, at about two inches distance from each other. The grass with which they build is called the Boshman's grass, and I believe the seed of it to be their principal food, though, on examining their nests, I found the wings and legs of different insects. From every appearance, the nest which I dissected had been inhabited for many years, and some parts of it were more complete than others. This, therefore, I conceive to amount nearly to a proof that the animals added to it at different times, as they found necessary, from the increase of the family, or rather of the nation or community."²

The genus *PYRGITA*, Cuv., contains the sparrows properly so called, of which the common house species (*P. domestica*) affords a familiar example. This bird is characteristic of the temperate and more northern parts of Europe, and is scarcely known in Italy to the south of Piedmont, being replaced by a closely-allied species, *P. cisalpina*, which is the *Passer volgare* of Italian authors. Although M. Temminck thinks that the manners of the latter are less domestic than those of our more northern kind, and that its love of fields and country places ally it rather to the *P. montana*, we doubt not that all who have lived in Italy will be of a contrary opinion,—in agreement with the following beautiful passage by Professor Savi, which we shall not injure by translating. "Sembra che quest' uccello non possa vivere se non con l'uomo. Eccetuate quelle regioni alpestri ove regnano perpetuamente i ghiacci, in qualunque altro luogo in cui l'uomo si è stabilito, la Passera l'ha accompagnato; e indifferente alla prospera, o contraria fortuna, essa ha posta dimora nella dimora di lui. In riva delli stagni, in mezzo alla quiete de' boschi delle Maremme, sulla povera ed umile capanna d'un pescatore o d'un pecorajo, han domicilio le passere, le quali trovano il loro cibo nella sementa di grano del piccolo campo, ne' frutti dell' orticello, nello scarso beccime gettato alle galline o a' piccioni. E nel modo stesso voi le vedete nel contro delle più grandi e clamorose città, porre il nido fra gli ornati d'una grandiosa cattedrale; o su i tetti d'un giardino di delizia, e cercare le granella o miche di pane in mezzo alle piazze più popolate. Ma se l'uomo cessa d'abitare

¹ *British Ornithology*, i. 241.

² *General Zoology*, vol. ix. p. 303.

Insector. quella capanna, o quella città, la passera anche essa l'abbandonava. Chi, girando nelle maremme, passa per antiche e disabitate abbazie, per fortificazioni, o ville in rovina, vedrà dalle finestre più elevate di quelle, fuggire de' piccioni insalvatichiti, udirà gridar la civetta che abita fra li spacchi de' muri vestiti d'ellera e parietaria, vedrà la ballerina continuare a fabbricarvi il nido, ma in vano egli la cercherà il volatile parassito dell' Europeo, quella specie d'uccello che prima per il numero ogni altro ne superava in quel luogo. Così nel modo stesso che una figura geometrica vista sulla sabbia fu giudicata dal naufraga Filosofo per un segno certo della vicinanza dell'uomo, per un tal segno ancora può ritenersi la presenza delle passere.¹ In regard to our own species, Savi observes, "non mi è noto se ne stiano anche in Lombardia, ma so di certo che alcuno giammai ne è stato visto in Toscana." According to Temminck, the boundary of the latter species is the great chain of the Alps, on the southern slopes of which it disappears in favour of the cisalpine kind. But it is our common British sparrow which occurs about Trieste, and through the north of Dalmatia, although separated from the region of *P. cisalpina* only by the waters of the Adriatic. "I costumi," adds the Italian author, "di queste due specie sono precisamente gli stessi. Io ho accuratamente ed in varj tempi osservate le abitudini della *F. domestica*, tanto in Svizzera che nel settentrione della Francia, e posso assicurare che le stesse sono di quelle della nostra specie Italiana."²

In the restricted genus *FRINGILLA*, Cuv., the bill is rather less arched than in the sparrows, and a little stronger and more lengthened than among the linnets. Cuvier includes in it the chaffinch (*F. cœlebs*), the mountain-finch or brambling (*F. montifringilla*), and the snow-finch (*F. nivalis*). The latter is scarcely ever found except in the near vicinity of ice and snow, and may be regarded (in common with *Acceper alpinus*) as the most mountainous of all the smaller birds of Europe. Yet though wild and solitary in our estimation, from associating it with the desolate scenery of the rock-surrounded glaciers, it is beautiful to see how, in the neighbourhood of the lonely shepherd chalets of the Alps, it loves to humanise its feelings; and how, among the few sad dwellings of the Mount Cenis, and other lofty passes, it perches on the roofs of houses, hops about the beaten foot-paths, and builds among dismantled yet protecting walls. In winter it seeks subalpine regions, or the snow-covered valleys of Piedmont, but scarcely ever migrates to the lowest plains. It is unknown in Tuscany.

In the genus *CARDUELIS*, Cuv., the bill is more exactly conic, without bulging in any portion, and is rather lengthened. We may name as an example, our beautiful, lively, and intelligent goldfinch (*C. elegans*, Steph.,—*F. carduelis*, Linn.), a bird widely distributed over Europe, and extending from the sultry shores of the Mediterranean to the plains of Siberia. It occurs in Holland only as a bird of passage. The siskin (*F. spinus*) is by some considered as a *Carduelis*, while others place it with the group which follows, viz. genus *LINARIA*; Bechstein, in which the bill is equally conical, but not so long. Here we place our gray linnets and red-poles, among which the more or less decided crimson tinting of the breast and forehead, according to age and season, has occasioned some confusion. Our common or gray linnet (*F. cannabina*, Linn.,—*F. linota*, Gmel.) is, in the perfect nuptial plumage, synonymous with the rose-linnet and greater red-pole. Our lesser red-pole is the *F. linaria* of Linn.; and the only other British species is the twyte or mountain-linnet, *F. montium*, Gmel., formerly regarded as a bird of passage, but now known to breed in the northern counties of Scotland, if not elsewhere in Britain. We have caught the young ones, half-

fledged, among the Grampian Mountains. The amount of foreign species is considerable. Of these, one of the most remarkable for its musical powers is the well-known canary (*F. canaria*, Linn.), a native of the Cape de Verd and other islands, where its natural plumage is green. It breeds readily in confinement with the linnet, goldfinch, siskin, and other species.

The genus *VIDUA*, Cuv., contains some remarkable species, with the bill more inflated at the base than the preceding, but chiefly characterized by the extreme elongation of the caudal plumage of the males. They inhabit India and Africa, and were placed by Linnæus among the buntings.

The genus *COCCOTHAUSTES*, Cuv., containing the gross-beaks, has the bill very conical, but of extreme thickness at the base, and rapidly tapering to the point. The culmen is rounded, the commissure slightly arched. The species occur in America, as well as in the ancient continents. The hawk-finch (*C. vulgaris*,—*Loxia coccothraustes*, Linn.) visits the southern parts of Britain occasionally during winter, and is even said to have been found breeding in Windsor Forest. It feeds upon the larger kinds of seeds and berries, which it is enabled to bruise and break at pleasure, by means of the great strength of its bill. The evening gross-beak (*C. vespertina*, Cooper) is a beautiful American species, with the frontal feathers and a line above the eye yellow, the crown, wings, and tail black, the secondaries and inner wing-coverts white, the bill pale yellow. This newly-discovered bird inhabits the solitudes of the north-western interior, being met with from the extremity of the Michigan territory to the Rocky Mountains, and it is not uncommon towards the upper end of Lake Superior and the borders of the Athabasca Lake. To the east of these regions it appears to be only a transient visitor during spring and autumn. Our homely and heavy-headed green linnet (*C. chloris*, Fleming), of which the mature male is a rich and beautifully plumaged bird, belongs to our present genus. It is probable that the *Fringilla incerta* of Risso, figured by M. Roux (in his *Ornithologie Provençale*), is nearly allied. It is one of the rarest of the European birds, appearing occasionally during the autumn in Provence, and likewise occurring in the vicinity of Palermo.

In the genus *PITYLUS*, Cuv., are contained a few species (almost all, we believe, from South America), in which the bill, though thick, as in the preceding, is rather compressed, arched above, and has sometimes a projecting angle in the middle of the margin of the upper mandible. Such are the *Loxia grossa*, *Portoricensis*, &c.

In the genus *PYRRHULA*, in which the bill is shorter and greatly bulged, we have the bullfinches, of which our British species, *P. vulgaris*, Temm.,—*L. pyrrhula*, Linn., is a well-known example. It is very generally distributed throughout our wooded districts, but is nowhere very abundant, and may be called scarce in several quarters of the island.

In the genus *LOXIA* of Brisson, as now restricted, the bill is compressed, and the two mandibles so curved and deflected, that when closed they cross each other. This extraordinary structure is supposed to afford the species great facility in stripping the scales from the well-protected seeds of the various kinds of pine-trees. The cross-bills are few in number, and occur both in Europe and America. Their habits as breeding birds are little known, but the period of incubation must be very early, as *L. curvirostra* sometimes visits this country in small flocks as early as June. Temminck says, somewhat vaguely, in regard to the parrot-billed species (*L. pytiopsittacus*), that it "niche en hiver dans nos climats, sur les branches de sapin; en Livonie l'espèce niche dès les mois de Mai."

¹ *Ornithologia Toscana*, t. ii. p. 100.

² *Ibid.* p. 106.

Insectores. Their chief haunts are probably within the arctic circle. In America they are believed to breed about Hudson's Bay, being seen in the United States only from September to April. It thus appears, at all events, that they do not there breed during the winter season.

The great pine gross-beak (*Loxia enucleator*, Linn., by some regarded as a bullfinch) may be here named as belonging to the genus *CORYTHUS* of Cuvier. It is a northern species, occurring in the colder regions both of Europe and America. Although Pennant mentions having met with it in the woods of Invercauld in the month of August, we are not aware of its having ever since been seen in Scotland.

In the genus *COLIUS*, Gmelin, the bill is short, thick, conical, somewhat compressed, both mandibles arched, and of nearly equal length. The feathers of the tail are long and graduated, and the plumage, for the most part fine and silky, is usually ash-coloured. The hind toe can assume a forward direction, almost as in the swifts. (See Plate CCCXCII. fig. 3.) The species are found in India and Africa. Prior to the time of Vaillant, we knew little of their habits. They are now known to be gregarious, endowed with but feeble powers of flight, but almost as skilful as parakeets in climbing. They are not at all addicted to insect food; but their love of fruits, and the tender buds of trees, makes them very injurious wherever land is under horticultural care. They not only dwell together in society, but build their nests in little groups upon the same thorny bush. They are moreover distinguished by a singular custom of sleeping close together, suspended head downwards from the branches. The species here represented (Plate CCCXCII. fig. 2) is *C. leucotus*, Lath. (*C. erythropus*, Gmel.), supposed to be identical with *C. capensis*, Linn.

The genus *BUPHAGA* of Brisson has the bill square at the base, and rather gibbous towards the point, which is abbreviated. The species, only two in number, are insectivorous, and have derived the name of beef-eaters from their habit of picking larvæ from the hides of the larger kinds of cattle, thus freeing them from noxious parasites. The South African species (*B. Africana*, Linn.) was observed by Vaillant in the country of the Namuquas in small flocks. He found it shy, and difficult to be approached. The other species referred to this genus is the *B. erythrorhyncha* of Temm., common in the north-eastern countries of Africa, where it follows caravans for the sake of picking insects from the woolly backs of camels, and other beasts of burden. It is singular, that although hitherto unknown in Southern Africa, it should have been received from Madagascar.

In the genus *CASSICUS* of Cuv. the bill is much more exactly conical, thick at the base, extremely sharp pointed, the commissure forming an angulated line as in the starlings. These are American birds of gregarious habits, which feed both on fruits and insects, and frequently exhibit such surprising skill and ingenuity in the structure of their nests, that an old lady once gravely asked an American Ornithologist whether he did not think they might be taught to darn stockings. In the genus *CASSICUS* properly so called, the base of the bill ascends upon the forehead, so as to encroach broadly upon the frontlet feathers. Here are contained the largest species. The one we have figured (*C. cristatus*, Plate CCCXCII. fig. 5) is from

Cayenne. In the genus *ICTERUS* the bill is arched, and does not extend upon the forehead except by a sharp notch.¹ With the *Icteri* Cuvier combines the purple grackle, or crow blackbird of America (*Quiscalus versicolor* of Vieillot), between which and the fish-hawk a singular understanding seems to be kept up. The nest of the latter is of large dimensions, often from three to four feet in breadth, and from four to five feet high, composed externally of large sticks or faggots, among the interstices of which several pair of crow blackbirds will construct their nests, while the hawk sits hatching over all. These birds are very injurious to the crops of Indian corn, and sometimes collect in prodigious flocks, descending on the fields like a blackening tempest. They occupy a great extent of territory, being widely spread from Hudson's Bay to within the tropics. They are migratory in the colder districts, and on their first arrival feed on insects as well as seeds.² According to Dr Richardson, their first appearance on the plains of the Saskatchewan is very striking. They arrive from their southern winter quarters in the beginning of May, the males and females in separate flocks of from twenty to a hundred, which perch in crowds upon the leafless branches of the trees, their plumage shining with metallic splendour.

The genus *XANTHORHUS* (*les carouges*) scarcely differs from the preceding, except that the bill is straight. Here Cuvier places many of the American orioles, such as the red-shouldered species (*O. phæniceus*, Linn.). These "red-winged starlings," as Wilson calls them, are generally migratory in the states north of Maryland, but are found during winter in immense flocks along the lower parts of Virginia, both Carolinas, Georgia, and Louisiana, particularly near the sea-coast, and in the vicinity of large fields of rice and corn. "In the months of January and February, while passing through the former of these countries, I was frequently entertained with the aerial evolutions of these great bodies of starlings. Sometimes they appeared driving about like an enormous black cloud carried before the wind, varying its shape every moment; sometimes suddenly rising from the fields around me with a noise like thunder; while the glittering of innumerable wings of the brightest vermilion amid the black cloud they formed, produced on these occasions a very striking and splendid effect. Then descending like a torrent, and covering the branches of some detached grove, or clump of trees, the whole congregated multitude commenced one general concert or chorus, that I have plainly distinguished at the distance of more than two miles; and when listened to at the intermediate space of about a quarter of a mile, with a slight breeze of wind to swell and soften the flow of its cadences, was to me grand, and even sublime. The whole season of winter, that with most birds is past struggling to sustain life in silent melancholy, is with the red-wings one continued carnival. The profuse gleanings of the old rice, corn, and buck-wheat fields, supply them with abundant food, at once ready and nutritious; and the intermediate time is spent either in aerial manœuvres, or in grand vocal performances, as if solicitous to supply the absence of all the tuneful summer tribes, and to cheer the dejected face of nature with their whole combined powers of harmony."³

In this genus some have also placed the noted cow-pen bird of Catesby (*Icterus pecoris*, Bon.; *Emb. pecoris*, Wilson), of which the most remarkable feature consists in its

¹ For a detailed classification of the *Icteri* of Brisson, see Mr Vigors's "Sketches in Ornithology," *Zoological Journal*, No. vi. p. 182.

² Great confusion exists in the nomenclature of these birds, and of their congeners the troupials, hang-nest orioles, and other American species, chiefly in consequence of the transposition of names. Almost every author has composed his groups of different materials, and of course has applied his designations differently. The genus *Quiscalus* of Vieillot contains four well-ascertained species, *Q. major*, *versicolor*, *ferrugineus*, and *baritus*.

³ *American Ornithology*, vol. i. p. 193.

Insectores. depositing, like our European cuckoo, its eggs in the nests of other birds. The circumstances by which Wilson first became acquainted with this peculiar habit are as follows. He had in numerous instances found in the nests of three or four particular species, one egg much larger and differently marked from those beside it. He at length detected the female of this cow-bunting, as he calls it, in the act, that is, sitting in the nest of the red-eyed fly-catcher, (her eyes might well be red, if she had ever fondly hoped for a legitimate posterity), which happens to be a very small one, and singularly constructed. Suspecting her purpose (and truly her position was more than suspicious), he cautiously withdrew without disturbing her, and had the satisfaction to find on his return, that she had left an egg exactly like that just alluded to. He afterwards, in many instances, found the young cow-bunting in the nest of these and of other birds, and also observed the latter followed by a foster child calling most clamorously for food. The cow-bird is gregarious and migratory, entering the middle and northern states about the end of March or beginning of April, and passing northwards as the season becomes milder. It arrives in the fur-countries in May, ranges to the sixtieth parallel, departs in September, and collects in large flocks in Pennsylvania during the following months, after which it retires to winter in the more southern states and Mexico. Its food consists of grain, grass, and worms, particularly certain intestinal ones, which it finds in the dung of cattle. The cow-bunting never pairs, and a state of general concubinage seems to prevail amongst them. Bred up as foundlings in the nests of other birds, and fed by foster parents,—owing their existence and preservation to a system of cunning deception, and commencing their career by the destruction of the natural inmates of that mossy dwelling in which they passed their own delusive infancy,—what hopes can here be cherished of the hallowed growth of home affections? When the female is disposed to lay, she appears restless and dejected, and separates herself from the unregarding males, who care not for posterity. Stealing through the woods and thickets, she pries insidiously into every bush and branch for a nest that suits her fancy, and into it she darts in absence of the owner, and in a few minutes is seen to rise upon the wing, relieved from all maternal care. If the egg be deposited alone, that is, in a previously empty nest, it is almost uniformly forsaken; but if the nursing mother has any of her own she immediately begins to sit. The red-eyed fly-catcher (*Vireo olivaceus*) proves a most assiduous foster-parent. In the beautiful basket-like nest of one of these birds, Mr Nuttall found an egg of each species, and the female fly-catcher already sitting. He removed her own egg, and left that of the stranger. She soon returned, and, as if sensible of what had happened, gazed steadfastly, shifted the egg, sat on it for a time, moved off, renewed her observation, and at length settled down upon her nest. Two or three days after, however, she was found to have left the premises. Yet another bird forsook two eggs of her own, because that of the cow-bird was taken away,—which proves that there is no accounting for tastes. The blue bird, which exhibits a strong attachment to its breeding places, affords one of the few examples of a species not refusing to lay after the stranger's egg has been first deposited. Mr Pickering observed two nests of the blue-eyed yellow warbler, in which, previous to their own laying, an egg of the cow-bird had been deposited, and finding themselves unable to eject it, the warblers buried it in the bottom of the nest, by building over it an additional story! The egg of the cow-bird, perhaps from being larger, and coming thus into closer contact with the body of its nurse, is sooner hatched than

the others. The produce of the latter, though often stifled, *Insectores.* are sometimes reared along with the intruder. If the natural offspring die, they are found lying at some distance from the nest, and not directly beneath it, which shows that they are carried out by the parents, and not heaved over by the giant intruder, as in the case of our European cuckoo. When fully fledged, the cow-bird soon deserts his foster-parents, and skulks for a time about the woods, till he instinctively joins a few of his own blood, and then he seeks his food more boldly (five or six together), in the fields and lanes.¹ This bird measures about seven inches in length. The head and neck are blackish-brown, the rest black, glossed above with green, and on the breast with violet.

The Baltimore oriole is another beautiful species of *Icterus*,—*I. Baltimoreus*. The male is orange, with the head, neck, upper part of the back, and greater portion of the wings, black. It winters in South America, but makes its appearance in the United States in spring, where its arrival is hailed as the sure harbinger of warmth and sunshine. Full of life and activity, it is seen vaulting like a fiery sylph among the boughs of lofty trees, vanishing with restless inquietude, and again flashing quickly into sight from amidst some wreath of waving foliage, showing like a living gem amid the green adornment of the leafy forest. The most remarkable instinctive feature of this bird is displayed in the structure of its nest, which consists of a pendulous cylindrical pouch of six or seven inches in depth, usually suspended almost from the extremity of some lofty drooping branch. The materials, according to Wilson, are flax, hemp, cow-hair, and wool, woven into a complete cloth, the whole being tightly sewed through and through with long horse-hairs, several of which measure two feet in length. The bottom is composed of thick tufts of cow-hair, also sewed, and strengthened with strong horse-hair. The materials, however, vary, and so solicitous is the bird to procure the best that can be possibly obtained, that during the building season the women in the country are under the necessity of narrowly watching their thread when bleaching.

The genus *OXYRHYNCHUS*, Temm., has the conical sharp-pointed bill of the *Icteri*, but it is shorter than the head. Example, *O. cristatus*, Swainson's *Illustrations*, vol. iii. pl. 49,—a Brazilian species. The genus *DACNIS* of Cuvier is formed by the *Motacilla cayana* of Linn.

The genus *STURNUS*, Linn., also resembles the *Icteri*; but the bill is depressed towards the extremity. There are two European species, one of which, our common starling (*S. vulgaris*), is well known in many parts of Britain, and is remarkable for its gregarious habits, and singular aerial movements. Its glossy black and purple plumage, starred with little spots of white, render it a very ornamental bird; and the great facility with which it may be taught to speak makes it much sought after as a domesticated species. *S. unicolor* inhabits Sardinia and the South of Europe.

Baron Cuvier concludes the conirostral tribe with three well-marked groups, the crows, the rollers, and the birds of paradise.

In the genus *CORVUS*, Linn., the bill is strong, straight, rather long, compressed towards the point, the nostrils covered by stiff, reversed feathers. The plumage, though generally dense and dark, is soft and lustrous, and the species bear so great a resemblance to each other, that, as Mr Macgillivray observes, the most unpractised observer can scarcely fail to distinguish a crow. They also exhibit corresponding instincts, being, if not shy, at least cunning and watchful. They are omnivorous in the fullest sense of the term, and will poke their beaks into every thing

¹ Nuttall, vol. i. p. 178.

Insessores. they can find, from a boiled potato to a dead horse. "When searching for food, they betake themselves to open places, walk in a sedate manner, keep a good look out, and on the least appearance of danger fly off to a distance. Their flight is also sedate, moderately rapid, and performed by regular beats. Their cry varies from a hoarse croak to a caw or chatter, and some of them are musical. They nestle in high places, trees, towers, buildings of various kinds, or rocks; and produce from three to nine eggs, which are deposited very early in the season. They repose at night in similar places, and when alarmed by day generally take themselves to heights. Some species are gregarious, others unsocial,—the latter being the more carnivorous; but even they are observed to associate together when a large quantity of food attracts them to a particular place. The sexes do not differ much in external appearance; the male, however, being in general more robust, and having the plumage more glossy. Moulting takes place in the summer months, and is very gradual. Those which are more carnivorous have the faculty of discovering carrion at a great distance, in the same manner as the vultures, which they in some degree resemble in their habits. They are all easily tamed, and may be taught to imitate the human voice so far as to produce a few articulate sounds. In a state of domestication they are much addicted to pilfering, their depredations not being confined to articles of food, but extending to objects in no respect useful to themselves."¹

Five species of crow occur in Britain, all permanent dwellers, viz. the raven (*C. corax*), the carrion-crow (*C. corone*), the hooded crow (*C. cornix*), the rook (*C. frugilegus*), and the jackdaw (*C. monedula*). We shall not describe the external aspect of these birds, which, we doubt not, are familiar to our readers. The raven in a state of nature is remarkable for his great cunning and sagacity, while in the domesticated condition he is extremely frolicsome and full of humour. We have seen one that, while engaged in amusing himself with a poodle dog, and unable to keep pace with his four-footed play-fellow, would seize him by a lock of hair, and hold on tenaciously while the dog was careering at full gallop; and his numerous devices, with a view to conceal the remnants of his own food, or appropriate that of others, were varied and unceasing. This species is widely spread over the temperate and northern parts of Europe and America, and in the minds of the ignorant is usually regarded with some degree of superstitious terror. In summer, when the sky is serene, he flies in circles in the higher regions of the clear blue sky, and his deep and solemn croak may be heard at a great distance; but he is said to be sometimes also seen in the midst of thunder-storms, with the electric fire streaming from the point of his bill!—an extraordinary phenomenon certainly (if true), sufficient to terrify the superstitious, and to stamp its subject with the character of a restless and indestructible demon.

The carrion-crow, and the hooded species, are so like in size and structure, that it would be scarcely possible to distinguish them, but for the partially gray plumage of the latter; and as a black and a gray crow are often seen together, some naturalists incline to the belief that they are actually the same. Their geographical distribution, however, seems to differ; the gray kind, though common in Britain and the continental countries of Europe, being unknown in America, where, at the same time, the carrion-crow is described as identical with our own; while, on the other hand, we find the latter extremely rare in the north of Italy, where the hooded crow abounds. The jackdaw and the rook seem unknown in the western world.

The magpies (genus *PICA*, Cuv.) are of smaller dimen-

sions than the crows properly so called, and their tails, instead of being either round or square, are long and graduated. Their dispositions, however, are equally omnivorous, and they are distinguished by the same sly and furtive cunning. There is only a single European species, our common British kind (*C. pica*, Linn.), which occurs all over Europe, and is well known in North America, and some parts of Asia. Many beautiful species occur in China, and other eastern countries, such, for example, as the red-billed pie, *P. erythrorhyncha*, Gould. Its size exceeds that of our common kind, and the great length of its tail bestows upon it a still more slender and elegant aspect. The prevailing colours are blue, with bars of black and white. It is often kept in aviaries, where it is highly esteemed, on account both of its docility and beauty. This species likewise inhabits the Himalaya Mountains, and there is reason to believe that it is fierce and tyrannical in a state of nature. Mr Shore states, that one which he kept in captivity, although it refused other food, pounced ferociously upon living birds, which were presented by way of experiment, and eagerly devoured them. When seen amid the foliage of trees, it forms an ornamental and conspicuous object, flitting from bough to bough; its long and flowing tail waving in the wind, and its whole form full of vivacity and grace.² The Chinese magpie (*P. sinensis*), made known by the researches of General Hardwicke, seems widely extended over tracts of land of very various character as to height and situation. It inhabits the higher portions of the Himalayas, the plains at the base of those mighty mountains, and a great part of the Chinese empire.

The beautiful jays (genus *GARRULUS*, Cuv.) are very nearly allied to the magpies, but the tail is not so lengthened, and the culmen of the under mandible is rather more convex. Our British species (*G. garrulus*) is one of the most ornamental of our indigenous birds. It dwells in woods, beyond the outskirts of which it seldom wanders. Its food consists of insects, fruits, and forest seeds. Species of this little group are found in every quarter of the known world except New Holland. The blue jay of America (*G. cristatus*, Plate CCCXCII. fig. 4) is an almost universal inhabitant of the western woods, frequenting the thickest settlements, as well as the deepest recesses of the unpeopled forest,—where his harsh voice often alarms the watchful deer, to the mortification of the disappointed huntsman. This species is a bitter enemy to owls, one of which he no sooner discovers than he summons the whole feathered fraternity to his assistance, and the united mob proceed to vent their indignant spite against the blinking solitary, in the most wrathful and unmeasured manner. But this jay himself cannot be held guiltless of the most owl-like depredations,—for he becomes in his turn the very tyrant he detested, and sneaks through wood and thicket, plundering every nest his poking bill can reach to, gobbling up the eggs, tearing the callow young to pieces, and spreading not only fear, but death, and sorrow, its sad concomitant, around him. Another very ornamental species—

Proud of cærulean stains
From heaven's unsullied arch purloined,

is that mentioned by Pallas as having been shot by Steller when Behring's crew landed upon the coast of America. It is the *Corvus Stelleri* of Latham, by whom it was first described from a specimen in Sir Joseph Banks's collection from Nootka Sound. A larger and most magnificent bird is the Columbia jay (*Garrulus Bullockii*, Wagler, — *G. gubernatrix*, Temm.), figured in Mr Audubon's splendid work. The colour is bright blue, with a lofty crest of separate plumes, the throat and breast black, the abdomen whitish,

¹ Macgillivray's *British Birds*, i. 496.

² *Century of Birds from the Himalaya Mountains*, plate xli.

Insectores. and two of the central tail-feathers extending far beyond the others. It occurs chiefly in Mexico and California.¹

In the genus *CARYOCATACTES*, Cuv., both mandibles are equally pointed, and straight to the tips. The only species known in Europe, called the nut-cracker (*C. nucifraga*), is an occasional visitant of Great Britain. Two others have of late years been discovered in Asia, one of which is figured by Mr Gould. They are all believed to inhabit forests, especially those of mountainous countries, whence at certain seasons they emigrate in large flocks. In their climbing tendencies they make an approach to the habits of the woodpeckers.

The limited genus *TEMIA*, Vail., with the lengthened tail and general proportions of the magpies, has the bill elevated, the upper mandible bulged, and its base covered by short velvety feathers. Example, *Corvus varians*, Lath. (*Phenotrix temia*, Horsfield), of which the general plumage is bronzed green, the head black. It occurs in Java and elsewhere.

In the genus *GLAUCOPIS*, Forster, the bill resembles that of the preceding; but its base bears a pair of fleshy caruncles. *G. cinerea* is the only known species. It is a native of New Zealand, and was discovered during Captain Cook's voyage. Its flesh is excellent. It is the cinereous wattle-bird of Shaw. M. Temminck joins this and the preceding genus into one.

In the genus *CORACIAS*, Linn., containing the rollers, the bill is strong, compressed towards the point, which is slightly curved, and the nostrils are oblong, not covered by the feathers, but placed at their margin. The feet are short and strong. These birds are confined to the ancient continents, and are remarkable for their beauty of plumage, of which the colours are usually different shades of purple, blue, and green. They are said to be wild and unsociable, feeding on insects, and keeping themselves concealed in the retirement of thick forests. The European species (*Coracias garrula*, Linn.) has been sometimes seen in Britain. The specimen in the Edinburgh Museum was killed at Dunkeld. Although rare in France, it is by no means uncommon in Sweden, where we would not expect to find a species characteristic of the south of Europe, and which is believed to winter in Barbary and Senegal. It is not unfrequent in the gardens of Rome, and is common in the Morea. It becomes very fat in autumn, and is much sought after during that season as an article of food, especially by the inhabitants of the Cyclades. Several other kinds occur in Africa and the East. Of these the Abyssinian species is distinguished by the elongation of the lateral feathers of the tail. The Madagascar roller, and some allied kinds, distinguished by a shorter, more arched, and greatly broader bill, belong to the genus *COLARIS*, Cuv., synonymous with *Eurystomus* of M. Vieillot.

The genus *PARADISEA*, Linn., with which we conclude our abridgment of the conirostral tribe, contains the famous birds of paradise, so noted during our early intercourse with eastern countries. The bill is straight, compressed, rather strong, unnotched, the nostrils surrounded by a close tissue of feathers of a velvet texture, sometimes resplendent with metallic lustre. (See Plate CCCXCII. fig. 8.) These birds are native to New Guinea and the neighbouring islands, and in consequence of the delicately graceful structure of their plumage, and the pure and beautifully blended colours by which they are adorned, the species in general may be regarded as the most highly prized of all the feathered race. Their history was long obscure as night, and even now we have but few features of their character developed by the actual observation of trustworthy witnesses. We cannot be here expected to throw

any new light upon the subject; but we shall give a portion of the information which we have acquired from various authors.

In the second edition of Pennant's *Indian Zoology*, there is a general description of the genus from Valentyn and other writers, by Dr J. R. Forster, preceded by a learned disquisition on the fabulous phoenix of antiquity, a bird of the size of an eagle, decorated with gold and purple plumes, and more particularly described by Pliny as being characterized by the splendour of gold around the neck, with the rest of the body purple, the tail blue varied with rose-colour, the face adorned with combs or wattles, and the head furnished with a crest. This excellently adorned phoenix Dr Forster very properly supposes to have been no other than a symbolical Egyptian illustration of the annual revolution of the sun, and the conversion of the great year, which, according to Manilius, corresponds with the supposed life of the phoenix, and from which period the same course of seasons and position of the heavenly bodies are renewed. Now, though it is certain, as Dr Forster observes, that the birds of paradise were never known to ancient writers, and that whatever the Egyptian priests delivered concerning their fabulous phoenix has no apparent agreement with the birds in question, yet it is remarkable enough that the names applied to them, both by Indian and European nations, attribute something of a supposed celestial origin. Dr Shaw, however, thinks that this notion has in all probability arisen merely from their transcendent beauty, and the singular and delicate disposition of their plumage. The Portuguese who navigated to the Indian islands called them *Passaros da Sol*, in like manner as the Egyptians regarded their imaginary bird as symbolizing the annual revolution of that great luminary. The inhabitants of the island of Ternate call them *Manuco-Dewata*, or the Birds of God.²

The great bird of paradise (*Paradisea apoda*, Linn., so called from its supposed want of legs), the first of the genus made known to Europeans, was imported about the year 1522, by Antony Pigafetta, who accompanied Magellan in his voyage round the world. Pigafetta was satisfied by ocular demonstration from the first, that this bird, like every other, was supplied with legs, but that the natives cut them off, as parts of no importance. In consequence, however, of this prevailing if not universal mutilation, a notion soon obtained in Europe that the bird was naturally destitute of these common-place but useful organs, and that consequently it floated for ever in the air, winnowing with loving wings the gentle breezes, or at times suspending itself for a few brief moments from some lofty sun-illuminated tree, by the two peculiar lengthened filaments with which it is adorned. In accordance with this belief, it was of course consistent to suppose, that whatever individuals were obtained "on this dim spot which men call earth," had fallen from their aerial heights immediately before their dissolution. Even Aldrovandus, the most zealous naturalist of his age, having himself seen only such specimens as had been mutilated in the usual manner, accuses Pigafetta of audacious falsehood in asserting that the bird was naturally furnished both with legs and feet; and the great Scaliger, himself a naturalist of no mean order, gave equal credit to this foolish fancy.

The true residence or breeding-place of these birds seems to be Papua or New Guinea, from whence they make occasional excursions to some smaller neighbouring islands. They fly in flocks of about thirty or forty, led, it is alleged, by a single bird which the natives call their king, but which is said to be of a different species. It is further pretended, that when this bird settles, the whole flight settle also, in consequence of which they sometimes

¹ *The Birds of America*, plate xcvi.

² Shaw's *General Zoology*, vol. vii. p. 479.

Insessores. perish, being unable to rise again owing to the peculiar structure of their wings. They also always fly against the wind, lest their flowing plumage should be discomposed. While flying they make a noise like starlings, but their common cry rather resembles that of a raven, and is very audible in windy weather, when they dread the chance of being thrown upon the ground. In the Aru Islands they are seen to perch on lofty trees, and are variously captured by the inhabitants, with bird-lime, snares, and blunted arrows. Though many are taken alive, they are always killed immediately, embowelled, the feet cut off, the plumed skins fumigated with sulphur, and then dried for sale. The Dutch ships frequenting the sea between New Guinea and Aru, a distance of about twenty miles, not unfrequently observe flocks of paradise birds crossing from one to the other of these places, but constantly against the wind. Should a gale arise, they ascend to a great height, into the regions of perpetual calm, and there pursue their journey. With respect to their food we have little certain information from the older authors, some of whom assert they prey on small birds, a supposition which Dr Shaw inclines to think is favoured by their strength of bill and legs, and the vigour with which they act in self-defence. They are also said to feed on fruits and berries; and Linnæus says they devour the larger butterflies.¹

We owe the following observations to M. Gaimard, one of the naturalists who accompanied the expedition of Captain Freycinet, and who having had an opportunity of seeing several living birds of paradise in the island of Waigiou, has furnished us with some interesting details. He says that they appear to prefer to all other places the most dense and secluded portions of the forests. When the heavens are clear, they perch habitually on the summits of the tallest trees. They fly with rapidity, but in an undulating manner, as is usual with birds which are adorned with long decomposed or disunited feathers; and he confirms the old account, that the luxuriant length of their superb plumage induces them always to fly in the direction from which the wind proceeds. "Cette manœuvre," he observes, "est pour eux très-naturelle, puisqu'elle maintient les longues plumes appliquées contre le corps; dans une direction contraire, le vent ne manquera pas d'étaler et de relever ces plumes, et il en résulterait nécessairement un grand embarras dans le jeu des ailes." Their total disappearance on the approach of any storm or tempest shows their conscious weakness. In other respects, however, they are courageous, and even vindictive, pursuing fiercely any supposed enemy, however superior to themselves in strength of bill and talons. There is no instance, Captain Freycinet supposes (we now know he does so erroneously), of their being ever reduced to the domestic state; and they are never found caged by any natives of the Papous, where they are by no means rare, and where their skins form the principal object of commercial exchange between the insular inhabitants and the Chinese Indians or eastern Europeans. Authors (we speak not of those who assert that birds of paradise are nourished by dew, or by the perfume which exhales from fruits and flowers) have assigned different diets to these birds. Some say that they search for fruits and nectarous juices; others that they capture insects, and such small prey. There is truth in both statements, for it seems ascertained that they feed alike on fruits and insects. As to all those anxious interesting cares which precede, accompany, or follow incubation,—these and many other important particulars in their history are still unknown. The natives of New Guinea, in preparing the skins, content themselves by removing the fleshy mass of the body, and cutting off the two wings and legs. They then pass a piece of stick through the mouth downwards

to the tail. Few of the museums of Europe contain any *Insessores*. other specimens than these mutilated remains, which the gorgeous flowing feathers of the sides render still worthy of admiration, however unfit to convey a true idea of the natural state.

We shall next extract some interesting information from a work by M. Lesson, one of the few European naturalists who have had an opportunity of beholding these extraordinary creatures in their native haunts. "Les paradisiers ou du moins l'éméraude, seule espèce sur laquelle nous possédons des renseignements authentiques, vivent en bandes dans les vastes forêts du pays des Papous, group d'îles situées sous l'équateur; et qui se compose des îles Arou, de Waigiou, et de la grande terre nommée Nouvelle-Guinée. Ces sont des oiseaux de passage qui changent de district suivant les moussons. Les femelles se réunissent en troupes, s'assemblent sur les sommets des plus grands arbres des forêts, crient toutes à la fois pour appeler les mâles. Ceux-ci sont toujours solitaires au milieu d'une quinzaine de femelles qui composent leur sérail, à la manière des gallinacées.

"J'extrais de mon journal inédit les détails suivans, relatifs aux oiseaux de paradis: ils ont été écrits sur les lieux. *Journal Ms.*, t. vi. p. 19 et suiv. Les *oiseaux de paradis*, à l'exception de deux espèces, nous étaient apportés par les Papous, ce qui établit entre eux et nous un commerce actif d'échange. Je me procurai l'éméraude, le manucode, le loriot paradis orangé, le sifilet, le superbe, les épimaques proméfilis, et à paremens frisés, le magnifique, et le rouge. La quantité que les naturels de ces contrées apportaient à bord de la corvette la *Coquille* doit faire supposer que ces oiseaux, si estimés en Europe, y sont singulièrement multipliés. Le manucode se présente deux fois dans nos chasses, et nous tuâmes le mâle et la femelle. Cette espèce paraît monogame, ou peut-être n'est elle isolée par paires qu'au moment de la ponte. Dans les bois cet oiseau n'a point d'éclat; son plumage rouge de feu ne le décèle point, et sa femelle n'a que des teintes ternes. Il aime à se tenir sur les arbres de teck, dont le large feuillage l'abrite, et dont le petit fruit forme sa nourriture. Il a l'iris brun, et les pieds d'un bleu d'azur très tendre. Les Papous le nomment *saya*. Dès les premiers jours de notre arrivée sur cette terre de promesse (la Nouvelle-Guinée) pour le naturaliste, je fus à la chasse. A peine avais-je fait quelques centaines de pas dans ces vieilles forêts, filles du temps, dont la sombre profondeur est peut-être le plus magnifique et le plus pompeux spectacle que j'aie jamais vu, qu'un oiseau de paradis frappa mes regards; il volait avec grâce et par ondulations; les plumes de ses flancs formaient un panache gracieux et aérien, qui, sans hyperbole, ne ressemblait pas mal à un brillant météore. Surpris, émerveillé, éprouvant une jouissance inexprimable, je dévorais des yeux ce magnifique oiseau; mais mon trouble fut si grand que j'oubliai de le tirer, et que je ne m'aperçus que j'avais un fusil que lorsqu'il était déjà bien loin. On ne pourrait guère avoir une idée exacte des paradis d'après les peaux que les Papous vendent aux Malais, et qui nous parviennent en Europe. Ces peuples chassèrent primitivement ces oiseaux pour décorer les turbans de leur chefs. Ils les nomment *mambéfore* dans leur langue, et les tuent pendant la nuit, en grimpant le long des arbres où ils se couchent, et les tirant avec des flèches faites exprès et très courtes, qu'ils façonnent avec le rachis des feuilles d'un latanier. Les campongs ou villages de *Mappia* et d'*Emberakène* sont célèbres par la quantité des oiseaux qu'ils préparent, et tout l'art des habitans se borne à leur arracher les pieds, à les écorcher, à leur fourrer un bâtonnet à travers du corps, et à les dessécher à la fumée. Quelques uns plus adroits, et sollicités par les trafiquans

¹ Shaw's *General Zoology*, vol. vii. p. 462-4.

Insessores. Chinois, les dessèchent avec les pieds. Le prix d'un oiseau de paradis chez les Papous de la côte est au moins d'une piastre, et ces peuples préfèrent l'argent à tout autre objet, même à du fer travaillé.

" Nous tuâmes, pendant notre séjour à la Nouvelle-Guinée, une vingtaine de ces oiseaux, que je préparai pour la plupart. Ils appartenaient à diverses personnes de l'expédition, et notamment au capitaine. Je n'en avais point encore, lorsque M. Bérard, lieutenant de vaisseau, zélé pour les collections que je formais en simple particulier, et à mes frais, pour le Muséum, et pour remplir la promesse que j'avais faite au ministère, en m'embarquant, de recueillir les objets d'histoire naturelle, voulut bien m'en remettre un pour la collection. Depuis, j'en achetai un second d'un homme de l'équipage, que je lui payai 150 francs. J'en tuai ensuite un avec un grand nombre de femelles : on les voit au Muséum.

" L'éméraude en vie est de la taille du geai de France ; son bec et ses pieds sont bleuâtres ; l'iris est d'un jaune éclatant ; ses mouvemens sont vifs et agiles ; il ne se perche communément que sur le sommet des plus grands arbres. Lorsqu'il en descend, c'est pour manger les fruits de quelques arbres moyens, ou lorsque le soleil, dans toute sa force, lui fait un besoin de chercher de l'ombrage. Il affectionne certains arbres, et fait retentir les environs de sa voix perçante. Son cri lui devint fatal, parce qu'il nous indiqua les allures de cet oiseau. Nous l'épiâmes, et c'est ainsi que nous parvîmes à en tuer ; car, lorsqu'un paradisier mâle est perché, et qu'il entend bruier dans le silence de la forêt, il se tait et ne bouge plus. Son cri d'appel est un *voike, voike, voike, voiko*, fortement articulé. La femelle a le même cri, mais elle le pousse d'une manière bien plus faible. Celle-ci, déchue du brillant plumage de son époux n'a que de sombres atours. Nous en rencontrions à chaque arbre des vingtaines réunies, tandis que les mâles, toujours solitaires, n'apparaissaient que rarement.

" C'est au lever du soleil et à son coucher que l'oiseau de paradis va chercher sa nourriture. Dans le milieu du jour, il se tient caché sous le large feuillage du teck, et n'en sort point. Il semble redouter l'action des rayons brûlans de cet astre, et ne point vouloir s'exposer aux atteintes d'un rival. Nous apprîmes, par une longue expérience, à imiter la ruse de ce bel oiseau ; mais le zèle des tueurs de paradisiers était si grand que personne ne voulait tirer sur aucun autre oiseau de peur de les effrayer, et que, réduit à peu près à mes seules ressources, le tribut que quelques personnes me donnaient de leur chasse fut bien diminué ; plus curieux, dans l'intérêt de la science, d'un petit volatile inédit, que de posséder plus ou moins de dépouilles d'une espèce connue, bien que prisée, je ne guettaï des paradis que pendant quelques jours, et tuai d'ailleurs toute espèce qui arrivait à ma portée.

" Pour chasser les oiseaux de paradis, les voyageurs appelés à visiter la Nouvelle-Guinée doivent se rappeler qu'il est nécessaire de partir dès le matin du navire, d'arriver au pied de l'arbre de teck ou du figuier, que ces oiseaux recherchent à cause de leur fruit (notre séjour a eu lieu du 26 Juillet au 9 Août), avant quatre heures et demie du matin, et de rester immobile jusqu'à que quelques mâles, pressés par la faim, viennent sur les branches qu'on aura jugé à distance convenable. Il est indispensable de posséder un fusil à très longue portée, et chargé à gros plombs, car il est fort difficile de tuer roide un *éméraude*, et s'il n'est que blessé, il est bien rare qu'il ne soit pas perdu pour le chasseur, dans des fourrées tellement épaisses, qu'on ne peut y reconnaître son chemin sans une boussole.

" Le paradisier petit émeraude mange sans doute de

plusieurs substances dans son état de liberté. Je puis **Insessores.** affirmer qu'il vit de graines de teck, et d'un fruit nommé *amihou*, blanc rosé, de saveur fade et mucilagineuse, de la grosseur d'une petite figue d'Europe, et qui appartient à un arbre du genre *ficus*. Ces fruits plaisent à beaucoup d'oiseaux, car ils sont aussi recherchés par les *calaos*, les *manucodes*, et les *cassicans calibé* et *phonygame*.

" J'ai vu deux oiseaux de paradis conservés dans une cage, depuis plus de six mois, par le chef des commerçans Chinois, à Amboine. Ils étaient toujours en mouvement, et on les nourrissait avec du riz bouilli ; mais ils aimaient surtout les cancrelas (*blatta*). Ce Chinois me les fit 500 francs pièce ; alors, sans argent, et n'ayant point de crédit dans cette île, je ne pus réclamer ma solde, et ce fut en vain que j'offris des objets de valeur à ce trafiquant opulent, il fut sourd à mes prières. Pourquoi, sur l'argent que nous possédions à bord, pour frais accidentels, et qu'on a retourné à Paris, ne pas avoir acheté, pour le destiner à la France, un de ces magnifiques oiseaux, qui serait peut-être mort en route, mais dont les habitudes vivaces, et analogues à celles de nos pies, nous donnaient tant de chances de succès ?¹

We shall conclude our miscellaneous extracts in illustration of these birds, by a quotation from a recent English writer. The principal object of attraction to strangers at Macao is known to be the splendid aviary and gardens of Mr Beale, who, after a residence of forty years in that country, devotes his leisure to the cultivation of many of the most delightful productions of nature, and among these not the least remarkable is the living bird of paradise, as thus described by Mr Bennet. " The specimen in the possession of Mr Beale is a fine male, *Paradisea apoda* of Linnaeus, the *P. major* of Shaw. He was at the time I beheld him arrayed in his full and splendid plumage ; he is enclosed in a large and roomy cage, so as not by confinement to injure in the slightest degree his delicate and elegant feathers. This beautiful creature has been in Mr Beale's possession nine years, and was originally procured from the island of Bourou (one of the Molucca group), which is situated in about latitude 3° 30' south, and longitude 126° 30' east.... The neck of this bird is of a beautiful and delicate canary-yellow colour, blending gradually into the fine chocolate colour of the other parts of the body ; the wings are very short, and of a chocolate colour. Underneath them, long, delicate, and gold-coloured feathers proceed from the sides in two beautiful and graceful tufts, extending far beyond the tail, which is also short, of a chocolate colour, with two very long shafts of the same hue proceeding from the uripigium. At the base of the mandibles the delicate plumage has during one time (according as the rays of light are thrown upon it) the appearance of fine black velvet, and at another a very dark green, which contrasts admirably with the bright emerald of the throat.... The mandibles are of a light blue, irides bright yellow, and the feet of a lilac tint. This elegant creature has a light, playful, and graceful manner, with an arch and impudent look ; dances about when a visitor approaches the cage, and seems delighted at being made an object of admiration ; its notes are very peculiar, resembling the cawing of the raven, but its tones are by far more varied. During four months of the year, from May to August, it moults. It washes itself regularly twice daily, and after having performed its ablutions, throws its delicate feathers up nearly over the head, the quills of which feathers have a peculiar structure, so as to enable the bird to effect this object. Its food, during confinement, is boiled rice mixed up with soft egg, together with plantains, and living insects of the grasshopper tribe ; these insects, when thrown to him,

¹ Manuel d'Ornithologie, t. i. p. 387.

Insessores. the bird contrives to catch in his beak with great celerity; it will eat insects in a living state, but will not touch them when dead.

"I observed the bird, previously to eating a grasshopper given him in an entire or unmutilated state, place the insect upon the perch, keep it firmly fixed with the claws, and divesting it of the legs, wings, &c. devour it, with the head always placed first....It rarely alights upon the ground, and so proud is this creature of its elegant dress, that it never permits a soil to remain on it; and it may be frequently seen spreading out its wings and feathers, and regarding its splendid self in every direction, to observe whether it is in an unsullied condition."¹

Dr Shaw alludes to an instance of the bird of paradise having been brought alive to England. It had, however, entirely lost the beautiful floating feathers which render its body apparently so light and buoyant, and did not long survive its arrival in our murky clime.

Although there are not above seven distinct species of these birds, they have been formed into no less than four separate genera by M. Vieillot. The most anciently known is the kind called in English books the great or common bird of paradise, *l'éméraude* of the French, *P. apoda*, Linn. to which most of the preceding memoranda may apply. (See Plate CCCXCII. fig. 6.) It is of a cinnamon colour, the upper part of the head and neck yellow, the front and throat emerald green, or black. It is the male of this species which bears the long, floating, yellow plumes so prized as articles of commerce, with a view to ornament in dress. Although the body is no larger than that of a thrush, the total length is two feet. In the red paradise bird (*P. rubra*) the head and throat are emerald-green, the back and front of the neck orange yellow and velvety, the throat chesnut or cinnamon colour, and the long feathers of the flanks brilliant carmine red. The two peculiar barbless shafts which proceed from the base of the tail, are broad, flattened, twisted, and of a brownish-red colour. These belong to the restricted genus *PARADISEA*.

The six-shafted paradise bird (*P. sexsetacea*, Shaw,—*P. aurea*, Gmel.) is black, with the throat of golden green, and three prolonged setaceous feathers proceeding from behind each eye, and terminating in a little expanded disk of golden green. It forms the genus *PAROTIA* of Vieillot. We shall merely add, that *P. superba* constitutes the genus *LOPHORINA*,—*P. regia* that called *CICINNURUS*,—and *P. nigra*, Gmel., another named *ASTRAPIA*. The whole are figured by Buffon, Vaillant, or Vieillot, and their singular forms, gorgeous colouring, and exquisite structure of plumage, render them deserving of the most attentive consideration on the part of all admirers of nature.

TRIBE 4TH.—TENUIROSTRES.

Baron Cuvier here places a variety of generic groups which agree chiefly in possessing a slender lengthened bill, sometimes straight, sometimes considerably curved. According to the structure of the tongue, which in several genera is not yet distinctly known, they feed either on insects or the nectarous juices of fruits and flowers,—a few, such as the humming-birds, combining both these habits.

In the genus *Sitta* the bill is straight, pointed, compressed at the extremity, and the tongue short and corneous. The species called *nut-hatches* climb along the bark of trees with extraordinary facility, not only upwards, like the woodpeckers, but downwards, and in all directions. The European species (*S. Europea*), though a constant resident in Britain, is rather rare in most localities. It breeds in hollow trees, not seldom using the deserted habitation of a woodpecker, the opening into which it contracts by

means of a wall of clay. The female sits very close during incubation, and instead of flying off when approached, she will utter a hissing sound, and make a show of striking at the intruder with her bill and wings. Sir W. Jardine some time ago enjoyed an opportunity of observing a brood which had been taken young. They became remarkably tame, and when released from their cage, would run over their owner in all directions, poking into seams and pockets, as if in search of food upon some goodly tree, and uttering from time to time a low and plaintive cry. In climbing, they rest much upon the tarsus, but never use the tail. Several true nut-hatches occur in North America, but Pennant erred in supposing that the European species was likewise indigenous to the new world.

In the genus *Xenops* of Illiger, the bill is rather more compressed, and the under ridge more convex, while in *ANABATES* of Temm. it is the upper ridge which increases in convexity, so as to approach to that of the thrushes; but the tail in some of the species is long and wedge-shaped, and exhibits a worn appearance, as if it were occasionally used in climbing.

In the genus *SYNALLAXIS*, Vieil., the bill is straight, not much lengthened, considerably compressed, slender and pointed, and the tail is generally long and acuminate. (See Plate CCCXCII. fig. 7.) We know little of the habits of these birds, except that they are insectivorous, and dwell in forests. Most of the species are from South America, and to these it is probable that the generic term should be restricted.

The old genus *CERTHIA* of Linnæus was characterized by an arched bill, but the species possessed but little else in common, and have been therefore formed into several minor groups. The true or restricted creepers (*CERTHIA*, Cuv.), so called from their habit of running round the trunks of trees, have the bill of medium length, curved, compressed, slender, sharp pointed. The tail is wedge-shaped, and composed of stiff, deflected feathers. Our well-known British species (*C. familiaris*) is the only example of the genus found in Europe, and it is in fact doubtful whether there is any other elsewhere. The North American creeper seems identical, but the numerous other birds described as creepers do not belong to the genus *Certhia*. The solitary type alluded to is a retired inhabitant of the woods, in no way conspicuous in colour, though pleasingly mottled above with black, brown, and grayish white; and being of small size, and seldom showing itself in open places, is deemed rarer than it really is. Though of a somewhat lengthened form, it is probably, with the exception of the golden-crested wren, the smallest bodied British bird. It is said to feed entirely upon insects, although as a winter resident in many frost-bound regions, we shall not aver that it never swallows seeds. It builds in the hollows of trees, and may be often seen during the delightful autumn, when the rustling woods are fragrant with fallen leaves, flitting from the top of one trunk to the bottom of another, which it ascends by a kind of spiral progression, and then darting downwards to a neighbouring tree, it thus busily pursues from time to time its interrupted flight. This bird chiefly shows itself in our shrubberies and wooded pleasure-grounds in winter.

In the genus *DENDROCOLAPTES*, Hermann, the tail resembles that of the preceding, but the bill is much stronger, and enlarged at the base. In certain species it is greatly curved. (Plate CCCXCII. fig. 9.) These birds are American, and are usually characterized by a reddish plumage. In *TICHODROMA*, Illiger, the tail does not present a worn appearance at the point, although the best known, if not the only species, runs up rocks with great agility. The bill is long, slender, triangular, and depressed at the base.

¹ *Wanderings in New South Wales*, &c. vol. ii.

Insectores. The European species, called by us the wall-creeper (*T. phænicoptera*, Temm.,—*Certhia muraria*, Gmel.), inhabits the southern countries of Europe, where it dwells among lofty and precipitous rocks. It is well known among the Swiss Alps, and the mountainous parts of Spain and Italy, where it is said to prey much on spiders and their eggs.

In the genus *NECTARINIA* of Illiger, the bill is arched, pointed, and compressed, resembling that of the creepers, with which the species were so long conjoined; but they do not climb, and their habits, if the name is properly applied, are not so much insectivorous as honey-sucking. They are all exotic. The term *guil-guil* is given by the French to certain small species, of which the plumage of the males is very rich and lustrous. Their tongue is bifid and filamentary. Such are *Certhia cyanea*, *cerulea*, &c. Some species of larger size and less adorned plumage, and of which the tongue is short and cartilaginous, have been separated from the others. Such is a South American species, the *Merops rufus* of Gmelin, as large as a nightingale, of a reddish colour above, the throat whitish. It constructs a covered nest, and serves as the type of Temminck's genus *OPETIORHYNCHUS*.¹

The genus *DICÆUM* of Cuv. has the bill longer than the head, sharp, curved, depressed, and broadened at the base. The species are of small size, and usually ornamented with portions of scarlet. They are natives of the East Indies. In *MELITHREPTUS* of Vieillot, the bill is extremely long, and curved almost into a semicircle. Of this form the hook-billed creeper, *Certhia vestitaria*, Shaw, affords a good example. (Plate CCCXCIII. fig. 2.) It is a native of the Sandwich Islands, where it is much valued on account of its plumage, which affords the principal material in the formation of those gorgeous scarlet mantles worn by chiefs and persons of distinction.

The *souimangas* (a Madagascar name, signifying sugar eaters, genus *CINNYRIS*, Cuv.) have the bill long, slender, and finely toothed along the edges. The tongue is capable of considerable extension, and terminates in a small bifurcation. The species are widely dispersed over all the southern regions of the old world (Africa, the Indian Archipelago, &c.), and seem in those countries to represent the beautiful humming-birds of the western world. Indeed these tribes greatly resemble each other both in form and habits. The *souimangas* are subject to a double moult, which occasions a considerable diversity in the plumage even of the same species, according to the season of the year; and hence our knowledge of this, as of several other sumptuous groups, though sufficiently voluminous, is probably not yet remarkable for its accuracy. Several splendid works, however, have been devoted, either in whole or in part, to its illustration.² The nuptial plumage is remarkable for its golden lustre, and the richness and variety of its innumerable iridescent hues; but after the termination of the breeding season, a much more humble garb is assumed, and many a *bizarre* appearance is presented by the intermediate links of that changeable costume which connects the holiday-suit of spring with the more quaker-like attire of autumn. Hence the difficulty of distinguishing in many birds, between a specific difference and an individual variation, more especially where foreign species are concerned; for in such instances we have seldom a prolonged opportunity of verifying our observations on external characters, by an examination of natural habits and instinctive modes of life. Yet it is only by ascertaining

the uniformity presented by all these circumstances in a variety of individuals, that we are enabled to trace out the exact limits of specific identity. Several species of *Cinnyris* occur in India, but the greater proportion are of African origin, and may be said to form the most signal and admired feature in the Ornithology of that country.

In the greater number the tail is equal. Of these we may name the superb creeper (*C. superba*), described and figured in the magnificent work of M. Vieillot. Its length is six inches; the crown of the head, upper part of the neck, smaller wing-coverts, back, and rump, are bright-greenish gold; across the upper part of the breast runs a bar of bright gilded yellow, beneath which the whole under parts are deep brownish crimson; the wings and tail are blackish brown, the legs are also brown, the bill is black. This beautiful species was discovered at Malimba, in Africa, by M. Perrein. Another highly adorned species, such "as limners love to paint, and ladies to look upon," is the *Certhia splendida* of Shaw (*C. afra* and *lotenia*, Linn.?). It usually occurs in woody places, and, in addition to its splendid plumage, is said to be worthy of admiration for its musical powers,—its song being by some esteemed equal to that of the nightingale. The spotted breasted *Cinnyris* (*C. maculata*) also dwells in the forests of Malimba, and frequently approaches the habitations of the natives, allured by the flowers of the *Cytisus cajan*, commonly called the congo pea, which, according to Dr Shaw, is much cultivated by the negroes.

In some of these birds the central feathers of the tail are lengthened in the males. Such is *C. violacea*, a Cape species, which likewise dwells in woods, and is said to build a nest of a singularly elegant construction. In a few the bill is almost straight, as in *C. rectirostris*, Vieillot. Our restricted limits will not admit of our expatiating on this delightful group.

The genus *ARACHNOTHERA* of Temm. has the long arcuated bill of the *souimangas*, but it is of stronger structure, and wants the dentations, and the tongue is short and cartilaginous. The species (such as *A. longirostris* and *inornata*, Temm. *Pl. Col.* 84, figs. 1 and 2), so far as yet known, inhabit the Indian islands, and prey on spiders.

The genus *TROCHILUS*, Linn., contains the true humming-birds, a numerous group of fairy and fantastic forms, which inhabit both continents of America, and some neighbouring islands, but are altogether unknown in the ancient world. The bill is long and slender, but in its range throughout the entire species exhibits considerable modification, being in some nearly straight, in others curved, and in a few turned upwards. Such as are characterized by an almost straight bill constitute the genus *ORNISMYA*, Lesson (*Orthorhynchus*, Lacepede), Plate CCCXCIII. fig. 1; while those in which it is more or less bent remain under the ancient name of *TROCHILUS*, *Ibid.* fig. 6. The tongue is long and extensile, and is usually described as being composed of two muscular tubes united for the greater part of their length, and broadening towards the point into a spoon-like portion. Sir W. Jardine, on relaxing a specimen of *T. moschatus*, observed the appearance of a fimbriated opening at the tip, the outer margin of each division being beset with recurved, sharp-pointed, pliable spines, while in all that Mr Swainson examined the two filaments were perfectly flat. Their feet are extremely small, their wings long and narrow, their tails comparatively broad,—whilst their shortened humerus and very large unnotched

¹ The generic name of *Nectarinia* was bestowed by Illiger upon those foreign creepers known by the terms *guil-guils* and *souimangas*, but it has been applied more exclusively by Cuvier to the former, and by Temminck to the latter. The *souimangas*, on the other hand, fall into Cuvier's genus *Cinnyris*, while the *guil-guils* are placed in the genus *Cereba* by Temm. These transpositions, as we have already remarked, are extremely perplexing.

² Vaillant, *Hist. Nat. des Oiseaux d'Afrique*, 5 vols. in 4to, 1799, and subsequent years,—and Audebert, *Oiseaux dorés, ou à reflets métalliques*, 2 vols. fol. Paris, 1802. A continuation of the latter work has been published by M. Vieillot.

Insectores-sternum exhibit osteological features in relation to the power of flight resembling those of swifts. The beauty of their plumage, if equalled, is certainly unsurpassed among the feathered tribes.

Humming-birds, in general, may be said to inhabit chiefly the intra-tropical regions of America, including the West Indies; but that they are capable of sustaining a considerable reduction of temperature, and of spreading themselves into comparatively rigorous climes, is evident from the observations of Captain King, who in his survey of the southern coasts met with numerous examples of these diminutive creatures flying about in a snow-storm near the Straits of Magellan, and discovered two species in the remote island of Juan Fernandez. Two other hardy species had been long known to migrate during summer far into the interior of North America, viz. the ruff-necked humming-bird (*T. rufus*), discovered during Cook's voyage in Nootka Sound, and since traced by Kotzebue to the 61st degree of north latitude, along the western shores; and the ruby-throated humming-bird (*T. colubris*), which was found breeding by Mr Drummond near the sources of the Elk River, and is known to reach at least as far north as the fifty-seventh parallel. Mr Bullock also discovered several species at a high elevation, and of course a coolish temperature, on the lofty table-lands of Mexico, and in woods in the vicinity of the snowy mountains of Orizaba. The best and most ample history of these "feathered gems" may be gathered from the pages of Wilson and Audubon, while the superb adornment of their beautifully pencilled plumage, so rich in its varied combination of lustrous green and gold, may be studied with advantage in the sumptuous pages of M. Lesson.¹ They are of a most lively and active disposition, almost perpetually upon the wing, and darting from flower to flower with the busy rapidity rather of a bee than a bird. In the uncultivated districts of the country they inhabit the forests, but in peopled regions they flock without fear into the gardens, poisoning themselves in the air, while they thrust their long extensible tongues into every flower in search of food. According to Bullock, they will remain suspended in a space so small that they have scarcely room to move their wings, and the humming noise which they produce proceeds entirely from the prodigious velocity with which they vibrate these tiny organs, by means of which they will remain in the air almost motionless for hours together. An older writer, Fermin, a physician of Surinam, compares this action to that of the bee-like flies which in still and sultry weather we often see hovering in the vicinity of still waters; and Wilson says, that when a humming-bird arrives before a thicket of trumpet-flowers in bloom, he suspends himself so steadily that his wings become "invisible, or like a mist." They often enter windows, and after examining any fresh bouquets with which fair hands may have decked the table, they will dart like sun-beams out by an opposite door or window. During the breeding season they become jealous of encroachment, and exhibit great boldness in defence of their supposed rights. When any one approaches their nest, they will dart around with a humming noise, frequently passing within a few inches of the intruder's head. A small species called the Mexican star (*T. cyanopogon*) is described by Mr Bullock as exhibiting great intrepidity while under the influence of anger. It will attack the eyes of the larger birds, striking at them with its sharp, needle-like bill; and when invaded by one of its own kind during the breeding season, their mutual wrath becomes immeasurable, their throats swell, their crests, tails, and wings expand, and they fight in the air till one or other falls exhausted to the ground. Indeed

old Fernando Oviedo gives a still more alarming statement of their fiery temper. "When they see a man climb y^e tree where they have their nests, they flee at his face, and stryke him in the eyes, commying, goying, and returnyng with such swiftness, that no man woulde ryghtly believe it that hath not seen it."²

Although humming-birds may frequently suck the juices of flowers, those naturalists err who allege that they support themselves exclusively on that natural nectar. "For myself," says Wilson, "I can speak decisively on the subject: I have seen the humming-bird for half an hour at a time darting at those little groups of insects that dance in the air in a fine summer evening, retiring to an adjoining twig to rest, and renewing the attack with a dexterity that sets all our other fly-catchers at defiance." Mr Bullock thinks it probable that all the species eat insects, and he had repeated ocular proof that many of them feed on flies, which they both caught themselves, and used to steal from spiders' webs. It was only the smaller kinds, however, that they dared to molest, for the stronger spiders showed fight, on which the besiegers would shoot off with the rapidity of a sun-beam, and could scarcely be discovered but by the luminous glow of their refulgent colours. It may easily be conceived that creatures of such resplendent plumage, in spite of their irascible temper and pugnacious habits, are universal favourites wherever they appear; and that in "the sweet serenity of a summer morning," their visits to the dewy flower-beds of a cottage dwelling are surely welcomed with delight.

When morning dawns, and the blest sun again
Lifts his red glories from the eastern main,
Then through the woodbines, wet with glittering dews,
The flower-fed humming-bird his round pursues;
Sips with inserted bill the honey'd blooms,
And chirps his gratitude as round he roams;
While richest roses, though in crimson drest,
Shrink from the splendour of his gorgeous breast.
What heavenly tints in mingling radiance fly!
Each rapid movement gives a different dye;
Like scales of burnished gold they dazzling show,
Now sink to shade—now like a furnace glow!

In the summer of 1803 a nest of young humming-birds was brought to Alexander Wilson. They were nearly fit to fly; in fact, one of them did fly out of the window the same evening, and falling against a wall, was killed upon the spot. The other refused food, and in consequence of this foolish obstinacy its life next morning was nearly extinct. A lady in the house undertook to be its nurse, and placing it in her bosom, it immediately began to revive, which showed its good taste and natural sense of comfort. She then kindly dissolved a little sugar in her mouth, and thrusting its bill into the same, the creature sucked with great avidity. In this manner it was brought up until fit for the cage. Wilson kept it for three months afterwards, supplying it constantly with loaf-sugar dissolved in water, which it preferred to honey and water. He also gave it fresh flowers every morning, sprinkled with the sugary liquid. It appeared quite gay, active, and full of spirit, hovering from flower to flower as if in its native wilds (alas! it still was caged), and always expressed by its motions and chirping the greatest pleasure at the sight of every fresh supply of flowers. "Numbers of people," says our author, "visited it from motives of curiosity, and I took every precaution to preserve it if possible through the winter. Unfortunately, however, by some means it got at large, and, flying about the room, so injured itself that it soon after died."

Most of the preceding notices apply to the ruby-throated humming-bird (*T. colubris*, Linn.), the species of which

¹ *Histoire Naturelle des Oiseaux Mouches*;—*Hist. Nat. des Colibris*;—*Hist. Nat. des Trochilidés*.

² *History of the West Indies*, translated by Richard Eden, p. 199.

Insectores. the particular habits and general economy have been the most minutely studied. It sometimes makes its appearance in Louisiana as early as the 10th of March, and shows itself some weeks later in the northern states, varying not only with the latitude, but the temperature of each season. Its nest is described by Mr Audubon as being of the most delicate nature, the external parts formed of a light-gray lichen found on the branches of trees, or on decayed fence-rails, and so neatly arranged round the whole nest, as well as to some distance from the spot to which it is attached, as to seem part of the branch or stem. These little pieces of lichen, he and others allege, are glued together with the saliva of the bird; but whether this fact has been proved by observation, or is only a natural inference from the actual appearance of agglutination, we cannot say. The next coating, however, consists of a cottony substance, and the innermost of all of silky fibres obtained from various plants, and extremely soft and delicate. In this delightful little bed the female lays only two eggs, of an almost oval form, and colour of pure white.¹ Not more than ten days are required for hatching; the young are ready to fly in seven or eight days; they are fed or cherished by the parents for nearly another week; and Mr Audubon is of opinion that they are no sooner able to provide for themselves than they associate with other broods, and perform their migrations apart from the old birds, as he has sometimes observed twenty or thirty young humming-birds resorting to a group of trumpet-flowers when not a single adult male was to be seen.² The migration of birds, as Dr Richardson has well observed, has in all ages been an object of pleasing speculation to the philosopher; but in no instance does it appear more wonderful than when contemplated in relation to these tiny tribes. The lofty and sustained flight of the eagle and albatross seems only commensurate with their gigantic size, and the irresistible sweeping of their mighty pinions; "but how is our admiration of the ways of Providence increased, when we find that one of the least of its class, clothed in the most delicate and brilliant plumage, and apparently more fitted to flutter about in a conservatory than to brave the fury of the blast, should yield to few birds in the extent of its migrations."³

The only instance with which we are acquainted of a humming-bird having been brought alive to England, is that mentioned by Latham. A young gentleman, a few days before sailing from Jamaica, observed a female of *Trochilus mango* sitting on her eggs. He secured the bird, cut off the twig, and brought the whole on board his vessel. The mother was fed with honey and water, and during the voyage hatched two young ones, which surviving their parent, were landed in England and lived for some time in the possession of Lady Hammond, from whose mouth they readily sipped nectar. The longest survivor, however, died in about two months after its arrival. These frail creatures are in fact far too impatient of continuous cold to endure the climate of Britain during winter. We shall conclude by observing, that the species are very numerous, and, like the generality of extensive groups, have been of late partitioned into many minor genera by M. Lesson, and others who have devoted themselves to their consideration. The range of size, as well as of character, is considerable,—*Trochilus minimus*, which is no larger than an able-bodied bee, is the least of all the feathered race,—while *Trochilus gigas*, a "triton 'mong the minnows," is the largest of humming-birds, and almost equals the dimensions of a swallow.

In proceeding with our exposition of the tenuirostral tribes, we now approach the *Hoopoes*, in close approxima-

tion to which is placed the genus *FREGILUS* of Cuvier, containing only a single European species, the *Corvus graculus*, or red-legged crow of British writers, which we have already briefly noticed as a *Pyrrhocorax*. It is in truth so nearly allied to the Alpine crow (*C. pyrrhocorax*), or *choucard des Alpes*, both in structure and habits, and is so often seen in company with that species, that wherever the one may be placed, the other should not be far distant. M. Temminck, indeed, places them in the same genus, although the bill of the red-legged bird (or Cornish chough) is longer than the head, more subulate and slender at the point, and without any notch. Cuvier regards the *Corvus affinis* of Latham, and another species from New Holland, as both belonging to the genus *FREGILUS*.

The true hoopoes (genus *UPUPA*) are all distinguished by a crest upon the head, composed of a double row of lengthened plumes, and capable of being raised at pleasure. The only European species (*U. epops*, Linn. Plate CCCXCIII. fig. 3) is a summer bird of passage on the Continent, where it travels northward even as far as Sweden. It never breeds in Britain, though it sometimes accidentally occurs there. We had one sent us a few years ago from the county of Fife. This bird is called *bub-bola* by the Italians, most probably from its peculiar cry. It keeps itself concealed among the trees; but is constantly heard repeating the syllable *bu, bu, bu, bu, bu*, with such a strong sonorous voice, that it may be heard at a great distance. Its song properly so called is only uttered during the honey-moon. Although the hoopoe lives and builds in woods, it may be often seen, in search of insect food, in fields and pastures. The nest is generally placed either in the natural hollow of a tree, or in the deserted excavation of a woodpecker. It is composed outwardly of feathers, and is lined with the hair of cows and horses. The eggs are grayish white, finely spotted with brown. This bird is very common in Egypt. A nearly allied species (*U. Capensis*) is found at the Cape, and occurs also in the East Indies; but we presume M. Savi is in error when he says the genus is likewise known in America.

The genus *PROMEROPS* of Brisson has also an elongated slender bill, finely pointed, laterally compressed, somewhat convex above, with the nostrils open and cleft longitudinally. The tail is very long and graduated, and the tongue is extensile and bifurcated, so that the species are able to absorb the nectarous juices of flowers. The title seems now restricted to the African species, of which the only one distinctly known is the Cape promerops (*P. Capensis*, *Merops caffer*, Gm.), of a grayish brown above, with a white throat, bordered by two dark lines, the breast reddish, the abdomen yellow. The tail is of great length during the completed plumage; but the long, ribbon-like feathers are often absent, which greatly alters the external character of the bird. (See Plate CCCXCIII. fig. 5.)

In the magnificent and somewhat disputed genus *EPIMACHUS*, Cuv., the bill, though more robust in some of the species, resembles that of the two preceding genera; but the base, or region of the nostrils, is beset with short, rounded, scale-like feathers, after the manner of the birds of paradise, which they somewhat resemble, moreover, in the great extension of certain portions of their plumage. They are also native to the same countries. The *Epimachus magnificus* has the general plumage of a rich velvet black, the head and throat lustrous, with changing tints of green and blue. The tail is of ordinary length and structure, but the sides are singularly ornamented by long extended filamentous feathers. (See Plate CCCXCIII. fig. 7.) The female is much less adorned, being, according to M.

¹ Dr. Richardson describes the eggs as of "a reddish-white colour, and obtuse at both ends."

² *Ornithological Biography*, vol. i. p. 251.

³ *Fauna Boreali-Americana*, part ii. p. 323.

Insesores. Lesson, reddish above and gray below, streaked with brown. The *Epimachus superbis* is likewise of a velvet black, glossed in various parts with golden green and purple, the flank feathers greatly developed, and terminated by a brilliant edging. The tail is of such enormous length (Plate CCCXCIII. fig. 4) that the total extent of this species is nearly four feet. The female (*Upupa fusca* of Gmelin?) is described as reddish on the wings and tail, the body of a mingled black and brown. The two preceding kinds inhabit New Guinea. The *Paradisea alba* of the older systems is by some referred to our present genus, which has also been made to contain a beautiful New Holland species, known to the natives by the name of rifle-bird, and described by Mr Swainson under the title of *Ptilorus paradiseus*. It is the *Epim. regius* of Lesson and Garnot,¹ and was previously figured by Mr Wilson as *Epim. Brisbanei*, in honour of General Sir Thomas Brisbane, by whom it is believed to have been first transmitted to this country.² If not a true *Epimachus*, it certainly greatly resembles that genus, having the form and colouring of *E. magnificus*, and the same tendency (though less strongly developed) to an elongation of the lateral plumes. The obscure black and brown plumage of the female likewise corresponds to what M. Lesson regards as the sexual distinctions of the other species. We have had recent information, which confirms our former views, that it is not of honey-sucking propensities. It rather exhibits a tendency to scansorial habits; and in its search for insects its bill may be heard from some distance tapping the bark, like that of a woodpecker.

All the preceding groups of the PASSERINE ORDER belong to Cuvier's first primary division, which, as we said at starting (see page 567), is characterized by never having the outer united to the inner toe by more than the length of one or two phalanges.

Those which follow, on the contrary, forming the second and much less numerous primary division of our present order, have the outer toe almost as long as the middle one, and united to it as far as the base of the terminal articulation. Such a principle of division might, *a priori*, be inferred to lead to some serious mal-arrangement of the groups; for it is extremely unlikely that so trifling a character should be found in uniform accordance with other and more influential attributes, and the slightest study or most superficial inspection of this the *Syndactylous Division* of Baron Cuvier's passerine order will suffice to show that the said division is in many points extremely heterogeneous and unnatural. To prove this to the satisfaction of any one at all conversant with the character of the prevailing forms in Ornithology, it will suffice merely to enumerate its component parts, viz. the bee-eaters (*Merops*), the motmots (*Prionites*), the king-fishers (*Alcedo*), the todies (*Todus*), and the horn-bills (*Buceros*). It is indeed surprising that any one so gifted with the power of philosophical observation, so qualified by his profound acquaintance with comparative anatomy to trace the natural relations of living creatures, and so signally successful in his usual generalizations, should either have brought together, or permitted to remain in juxtaposition, so discordant a group. The regulating character supposed to be competent to amalgamate these discordant materials is alleged to consist simply in the close adherence of the outer and middle toe throughout a considerable portion of their length, that is, as far as the penultimate joints. Now, that this character by itself is of no avail in the formation of natural groups, is evident from two considerations:—1st, From its being found in numerous genera, which are admitted to bear no affinity to each other;—2dly,

from its being absent in some of the component members. **Insesores.** of a natural family, and present in others. We may illustrate this by an example. In the South American genus *Ampelis* there are genuine species, in some of which the outer and middle toes are united, while in others they are free. This is well seen in the beautiful *Ampelis carnifex*, in which these parts are joined together, while in the closely allied species *A. pompadoura* they are disunited. Having called the reader's attention to this inconsistency, we shall proceed to a brief sketch of the different generic groups above named.

In the beautiful genus *Merops*, Linn., the bill is elongated, somewhat triangular at the base, slightly arched, sharp pointed. The wings are long, and narrow at the extremity. The feet are short. The flight of these birds, commonly called bee-eaters, is easy and buoyant, resembling that of the swallow. The species are numerous in Africa and the East; but only one is accustomed to show itself in Europe, the *Merops apiaster*, or common bee-eater of English writers (to whom, however, it is one of the rarest of the feathered race), an elegantly-formed and richly-plumaged bird (Plate CCCXCIV. fig. 2). It arrives in the southern countries of the Continent in March, and departs in September. It flies in flocks, usually at a considerable elevation, and utters with hoarse and guttural voice, in startling disaccordance with its slender aspect, a continual cry of *gra, gra, gra*. It builds in deep horizontal holes in sandy banks, which it excavates in whole or in part, working vigorously with feet and bill, and kicking out the dry earth behind it with great dexterity. It lays six or seven eggs, white, lucid, and almost spherical. When the young are partly fledged, but not yet fit to fly, they creep to the mouth of their holes, where they seem to enjoy the happy summer light and genial sunshine; but on the least alarm they trundle stern foremost into their inner chambers, where they lie concealed until tranquillity again prevails. So accustomed do they seem indeed to this peculiar movement, that when taken from the nest, and placed in any more exposed position, they seek to escape by running backwards. In fact, for a time they seem unable to walk in any other direction. All these birds are exclusively insectivorous, and prey almost entirely on the hymenopterous tribes. Although they often take their food upon the wing, they also gather it from the ground; and whenever they espy the small hole which leads into the nest of wasp or bembex, they place themselves close beside it, and snap up the industrious tenants on their exit or arrival. The Italian contadini regard the cry of the bee-eater as a sign of rain when they hear it uttered from a great height. The appearance of this beautiful bird in England is accidental. We may add, that none of the species occurs in America.

In the genus *PRIONITES*, Illiger, the feet and form are similar, but the bill is much stronger than in the preceding, the margins of both mandibles are crenulated (see Plate CCCXCIV. fig. 3), and the tongue is feathered. These birds are natives of South America. The plumage of their head is loose, like that of our common jay, the tail is long and graduated, and in adult birds the two central feathers are often bare or barbleless for a space not far from the extremity. They prey on insects, occasionally attack small birds, and build their nests in the hollows of trees. Example, the blue-crowned motmot, *Ramphastos momota*, Gmelin.

The genus *ALCEDO*, containing the king-fishers, has the legs still shorter than the bee-eaters, and the bill long, straight, angular, and pointed (CCCXCIV. figs. 1 and 4). As originally constituted, it contained a numerous assemblage of species from various countries of the world, of shape

¹ *Voyage de Duperrey*, pl. xxviii.

² *Illustrations of Zoology*, vol. i. pl. xi.

Insectores. and proportions rather awkward than elegant, but almost all remarkable for great splendour of plumage. The size and length of the bill are usually disproportioned to the body, and the feet and legs seem of a diminutive and apparently inconvenient form; but the shining silky lustre of the feathers, and their rich and infinitely varied hues of the most brilliant green and blue, contrasted with different shades of orange, black, and brown, render the genus one of the most showy and attractive within the entire range of the ornithological system. The *Alcedo ispida* (our common king-fisher) is the only species which occurs in Europe, and it yields to few of its brethren in its lustrous beauty. It is one of the rarest, and certainly the most highly adorned, of all our resident species. It haunts the banks of lakes and rivers, building in hollows near their margin, and preys chiefly on small fish, on which it darts with the rapidity of an arrow, plunging its little gem-like body for one flashing moment in the crystal stream.

Certain modifications observable in the form of the bill, and accompanied, as usual, by a corresponding change of habits, have induced the division of the original genus. For example, we owe to Dr Leach the formation of the genus *Dacelo*, of which the type is the giant king-fisher of New Holland (*A. gigantea* of Latham). The bill is very strong, curved at the extremity, and bulged beneath. These species (called *martin-chasseurs* by the French) inhabit forests, and build their nests, not in the excavated banks of rivers, but in the hollows of lofty trees; whereas the true king-fishers (*martin-pecheurs*) are never found at any distance from the "pure element of waters." The former also feed on insects rather than fish, and, the larger kind especially, are clothed in a dingier and less adorned plumage.

The one above alluded to (*D. gigantea*) is described by Mr Bennet as well known to the colonists of New South Wales by the name of laughing or feathered jack-ass,—a designation which occasioned a lady at home to declare, that of all the wonderful productions of Australia, she thought nothing could equal the "feathered donkey." Its peculiar gurgling laugh, commencing in a low and gradually rising to a louder tone, is often heard by travellers, proceeding from the branch of some lofty tree, where the bird is watching for its prey. It is said that one seldom laughs without being accompanied by another, apparently anxious to join in a duet. This bird is respected by Australian gardeners for destroying grubs, &c.; and Mr Bennet reports, that it also deserves protection on account of its devouring mice and venomous reptiles. "A gentleman told me he was perfectly aware of the bird destroying snakes, as he had often seen them carry the reptiles to a tree, and break their heads to pieces with their sharp, strong beaks." "One of these birds, seen upon the branch of a tree near a river, looking so stupid, and nodding as if asleep, was shot, and it was then found that this peculiar manner proceeded from its having swallowed a small snake, which had got into the stomach, throat, and bill, but had not yet accommodated itself in the former cavity."¹

A rare and remarkable species, from the Moluccas, with a shorter bill than usual, and a much longer tail, sometimes called the ternate king-fisher (*A. dea*, Linn.), forms the genus *TANYSIPTERA* of Mr Vigors,—while a few small species which either want the inner toe, or possess it in a very rudimentary state, constitute the genus *CEYX* of Lacepede. The latter occur in India. Example, *A. tribachys*, Shaw. (Plate CCCXCIV. figs. 5 and 11.)

The genus *Todus* contains some small American birds, supposed to resemble the king-fishers in their general form, their feet, and lengthened bills; but the latter or-

gan is horizontally depressed, and obtuse at the extremity, the tarsi are more elevated, and the tail shorter. Their habits are insectivorous, and the species, very few in number as the group is now restricted, are by most Ornithologists arranged among the *Muscicapidae*, near the genera *Platyrhynchus* and *Muscipeta*. The best-known, if not the only species, is the green tody (*T. viridis*, Linn.). It is found in the Antilles, and some of the equatorial regions of South America, where it hunts insects like a fly-catcher, but builds in holes in banks, after the manner of a king-fisher. Its nest is placed in a little chamber at the termination of a tortuous gallery, and both sexes are remarkable for their strong attachment to their young. This delightful bird is named ground-parrakeet by the Creoles of St Domingo. Though not very rare, it usually dwells in wild and solitary places, which is probably the reason of its being by no means frequent in the collections of Europe. The male utters an agreeable song during the pairing season, but at other times the green tody is a very silent bird. Its flight is straight and rapid, and it sits at times both on stones and trees. (Plate CCCXCIV. figs. 6, 7, and 9.)

The genus *BUCEROS*, which includes the calaos or horn-bills, is the last of the great passerine order in the arrangement of Baron Cuvier (Plate CCCXCIV. figs. 8 and 10). It certainly differs greatly from those near which he makes it stand, nor does it amalgamate much better with its neighbours in more recent systems. The species are natives of Africa and India, and are characterized by their enormous bills, toothed along their edges, and frequently surmounted by an additional horny structure, which bestows on them a very striking and peculiar physiognomy. These excrescences vary considerably with the age of the individual, and are scarcely perceptible in the young birds. The horn-bills may be said to resemble the toucans in their heads, the crows in their general habits, and the syndactylous tribes in the form of their feet. Their tongue is very small. These birds may be regarded as omnivorous, as they feed indifferently on fruits, mice, small birds, reptiles, and even carcasses. They exhibit an awkward and uncommon aspect while in the act of flying, in consequence of the great size of their beaks and lengthened tails, and altogether their appearance is extremely uncouth. Perhaps one of the most singular features in their economy consists in their feeding greedily, and without injury, on the seeds of *nux vomica*.²

The African horn-bill (*B. Africanus*) is entirely black, and nearly as large as a turkey. The crowned species (*B. coronatus*) is a much smaller bird, scarcely equalling the size of a magpie. Le Vaillant saw a flock of more than five hundred of these birds, in company with crows and vultures, preying on the remains of slaughtered elephants. It is figured by Mr Swainson in the third volume of the first series of his beautiful Illustrations. A large and remarkable Indian species has been of late years described by Mr Hodgson. It measures four feet five inches from tip to tip of the wings, and is three feet six inches in length. Its body exceeds that of the largest raven, but is very lean and incompact. It is believed to feed chiefly on fruits, although it will seize upon reptiles when pressed by hunger. Its freedom from any offensive smell, and the excellence of its flesh, which is much esteemed as an article of food, go far to prove that its habits are chiefly frugivorous. In a domestic state it will eat meat either raw or dressed. Mr Hodgson's specimen, however, was fed mostly on boiled rice, mixed with ghee, and made into large balls. It was never observed to take any water. Whenever it swallowed a mouthful which on second thoughts it considered as somewhat too large, it imme-

¹ *Wanderings in New South Wales*, i. 222.

² *Edinburgh Cabinet Library*, British India, iii. 90.

Scansores. diately disgorged it for the sake of a little additional mastication.¹

ORDER III.—SCANSORES OR CLIMBERS.

This somewhat heterogeneous group, continued by Baron Cuvier as a separate order, forms, in the systems of our own more recent writers, merely an additional tribe in the primary division of the passerine or insectorial order. As the zoological treatises in our present work have been hitherto made conformable to the general principles which regulate the arrangement proposed by the great French anatomist, we shall not here swerve from our previous practice, although we doubt not, that among some recent alterations for the worse, there may also be found not a few for the better. We fear, however, that it may be some time before the Scansores, even of the modern systems, can be regarded as composed of very closely allied groups,—at least so long as people feel averse to see any natural connection between a creeper and a cockatoo. Be this as it may, our present order is composed of species the great majority of which possess two toes before and two behind; that is, one of the three anterior toes commonly so called, is either reversible at pleasure, or is permanently thrown backwards, so as to give great power and tenacity of grasp during their infinitely varied movements over the rugged bark or smoother branches of the forest trees, on which they chiefly dwell. By this peculiar structure many species are enabled not only to ascend with ease a perpendicular trunk, but to suspend themselves from the lower surface of a branch while searching for their favourite food, which consists of fruits or insects, according to the form of the bill, so greatly diversified in the scansorial order. In the parrot tribe the foot is also used in the conveyance of food to the mouth, and generally as a prehensile organ of a very perfect kind.

We are aware that more than one excellent Ornithologist has objected to the title of this order, as incapable of being strictly applied to the whole of the genera of which it is composed. It is no doubt true that many of the species (such as the cuckoo), in which the toes are in pairs, or yoke-footed, cannot climb, while it is equally evident that several other species (such as the creeper, *C. familiaris*, the already alluded to very distant connection of the cockatoo) are excluded from this order by reason of the structure of their feet, in spite of which, however, they contrive to climb unceasingly; and that under these circumstances the denomination cannot be rigorously applied as alike characteristic of what it contains, and as correctly exclusive of what it does not contain. But we believe the same objection may be made to apply at least with equal force to various parts of every other system yet proposed. The ordinal characters, considered in their totality, are seldom so natural, yet extended, as to admit of no exception; and it is extremely questionable whether a title should be immediately changed upon the discovery of every species which may not coincide with its most rigorous interpretation. In truth, this could not in many cases be effected merely on the consideration of a single character, without producing greater inconveniences than those which it is desired to obviate. Among scansorial birds, for example, we have several species with only three toes, and which it would therefore be unreasonable to expect should conform to the ordinal character of having two toes before and two behind. But in spite of that partial deficiency, they are, in every essential particular, "true to their order."

The bill in the scansorial tribes varies so greatly in the different genera, from the straight, lengthened, angular mandibles of the woodpeckers, to the deep, curved, compressed organ of the parrots, that we must omit all consideration of it in the ordinal characters, although the study of its form is essential in relation to the minor divisions. The species of this order are, with few exceptions, inhabitants of the forests, and usually build their nests in the hollows of ancient trees. Their powers of flight are not remarkable. The European genera are almost entirely insectivorous; the parrot tribe feed on fruits; the toucans exhibit a tendency to the carnivorous habits of the accipitrine tribes; while other genera sensibly enjoy a mingled or miscellaneous diet.²

The genus *GALBULA*, Brisson, has a straight, elongated, sharp-pointed bill, with the upper edge rather sharp; the legs are very short, and the anterior toes much united (Plate CCCXCV. fig. 1). The plumage of these birds, usually known under the name of *Jacamars*, is remarkable for its metallic lustre. The species inhabit South America, where they occur among trees in moist and marshy places. Examples, *G. paradisea* and *viridis*, Lath. They generally sit, according to Mr Swainson, on low naked branches in the forest paths, from whence they dart upon butterflies, spearing them with their long bills; and their haunts, indeed, may be frequently discovered by the ground being strewn with the beautiful wings of their mangled victims, the bodies of which they alone devour.³ "A bird called jacamar," says Waterton, "is often taken for a king-fisher, but it has no relationship to that tribe; it frequently sits in the trees over the water, and as its beak bears some resemblance to that of the king-fisher, this may probably account for its being taken for one; it feeds entirely upon insects; it sits on a branch in motionless expectation, and as soon as a fly, butterfly, or moth passes by, it darts at it, and returns to the branch it had first left. It seems an indolent, sedentary bird, shunning the society of all others in the forest. It never visits the plantations, but is found at all times of the year in the woods. There are four species of jacamar in Demerara; they are all beautiful; the largest, rich and superb in the extreme. Its plumage is of so fine a changing blue and golden green, that it may be ranked with the choicest of the humming-birds. Nature has denied it a song, but given it a costly garment in lieu of it. The smallest species of jacamar is very common in the dry savannas. The second size, all golden green on the back, must be looked for in the Wallaba forest. The third is found throughout the whole extent of these wilds; and the fourth, which is the largest, frequents the interior, where you begin to perceive stones in the ground."⁴ An Indian species (M. Lesson, however, assigns it to Cayenne), of which the bill is shorter, thicker, and somewhat arched, forms the genus *JACAMEROPS* of Le Vaillant (see Plate CCCXCV. fig. 2); and another from South America, with only three toes (*G. tridactyla*, Vieil.), constitutes the genus *JACAMAR-ALCYON* (Plate CCCXCV. fig. 3). These names, however unmusically composed, point out the natural relationship of our present group to the bee-eaters and king-fishers, with which (as *fissirostral* birds) they are combined in some modern systems.

The genus *PICUS*, Linn., contains the well-marked, numerous, and extensively distributed tribe of woodpeckers, which occur in all the great divisions of the earth, with the exception of New Holland. The vast and solitary forests of North and South America are, however, their chief dominion, the greatest number, both there and in the old world, being found within the tropics. The bill is rather long, straight, angular, somewhat compressed or wedge-

¹ Transactions of the Physical Class of the Asiatic Society of Bengal, part i. p. 178.

² Wilson's Illustrations of Zoology, vol. i. art. SCANSORES.

³ Nat. Hist. and Class. of Birds, ii. 154.

⁴ Wanderings, p. 137.

Scansores. shaped at the extremity, and admirably fitted for splitting the bark or excavating the decayed portions of trees. The tongue is long, and capable of great protrusion, in consequence of its muscular basis, and the length of the horns of the *os hyoides*. It is not only furnished with little spines pointing backwards, but is covered by a glutinous moisture secreted by the salivary glands, which aids in the capture of the smaller insects, the larger, it is said, being usually transfixed by the point itself. The tail-feathers are very stiff and elastic, and greatly aid the motion of the feet in climbing, being pressed upon the bark, so as in some measure to support the body. Woodpeckers are shy and solitary birds. During the breeding season they dwell in pairs, and are only met with in small family flocks throughout the autumn. With the exception of the parrots, they form the most extensive group among scansorial tribes, between one and two hundred species being known to naturalists. We have only four in Britain, viz. the green woodpecker (*P. viridis*), our most common species; the great black woodpecker (*P. martius*), which is a much rarer bird; the great spotted woodpecker (*P. major*); and the lesser spotted kind (*P. minor*). Besides these, several others occur on the continent of Europe.

In whatever clime or country woodpeckers are found, they are characterized by strong affinities of form and colour, and constitute a very natural group, although some slight modifications of the bill have given rise in recent times to the formation of a few subgenera.

Buffon has drawn a melting picture of the miseries of a woodpecker's life. According to the views of the always eloquent, but frequently erroneous and sometimes inconsistent Frenchman, no bird which earns its subsistence by spoil leads a life of such painful and uninterrupted labour. Nature appears to have condemned it to incessant toil,—for while other species freely employ their courage or address, and either glide along on fearless rapid wings, or lurk insidiously in closer ambush, the woodpecker is constrained to drag on a miserable existence in boring through the scaly bark and tough unyielding fibres of the hardest trees. Necessity admits no intermission of its labours,—no interval of sweet repose. Not even the darkness of the night, nor sleep, that “soft restorer,” who throws her balmy mantle over such a mass of human misery, brings any solace here,—for the nocturnal hours are spent in the same constrained and painful posture as are those of day. It never shares in the joyous sports of the other inhabitants of the woods, and so far from joining in their glad responses, it rather deepens the natural sadness of the forest glades by its wild and melancholy cries. Now, what is all this but the most fantastic coinage of the brain?—as if the blessed beings which people this gladsome world endured the primal curse, and shared the self-inflicted ruin of our race! as if their joyful hearts were ever pressed by sorrow, or responded in wailing sadness to the woes of man! Spirit of Eblis! not yet has thy malign influence so encroached upon the “Benigner Power.” Is there any thing on earth for which we may not cry alas! saving only the omnipotent goodness of God, who careth “for all his creatures,”—and amid the unmeasured wretchedness which springs from human folly, the wan faces of our fellow-men pent up in close-built cities, the drunkard's hollow eyes, his shaking limbs, and tattered garments (and all the horrid ills that vice is heir to), what is more inspiring than to see even a fragment of the face of nature,—some little open plot of garden ground, where in spring the blackbird still may sing his evening hymn, or the autumnal red-breast cheerily announce approaching winter? Is there sorrow there or suffering, save what may spring from some dark spirit in the mind of man, the “immortal rebel?” When Buffon himself, a great interpreter of nature, in spite of all his fitful fancies, yielded up his life to God who gave

Scansores. it, did the lilled fields of France reflect the sun's warm rays less brightly, or her sylvan choristers welcome with sadder note the rosy day-break of the ensuing morn; or when that more wretched hour arrived (which the hoary but irreverent parent was saved the pain to see) when his son's fair locks, dishevelled but not dishonoured, were streaming on the blood-stained floor of that insatiate scaffold, what cared the gladsome birds in field or tree? It would indeed be but a doleful thought, if misery such as man so often meets with among human kind, and which he is therefore prone to picture, were to spread itself from his own sad bosom into the depth of darkly shaded forests, where so many gorgeous feathered inmates dwell, or among ocean rocks amid upheaving waters, or wave-worn caves, or crystal rivers with their golden sands.

Let those who dwell with pity on the fate of our condemned bird go with us to America, and listen to the high-toned note of *Picus principalis* (the name itself might “threaten and command”), echoing from the giant trunk or moss-grown arm of some colossal tree, or watch his varied movements, while from gnarled stems he drives off impetuously broad flakes of flashing bark, which so accumulate around the base of pine or cypress, as if a human carpenter had there set up his habitation. Or if we cannot go to America, let us read a great observer's history of another species. “No sooner,” says Audubon, “has spring called them (the golden-winged woodpeckers) to the pleasant duty of making love, than their voice, which by the way is not at all disagreeable to the ear of man, is heard from the tops of high decayed trees, proclaiming with delight the opening of the welcome season. Their note at this period is merriment itself, as it imitates a prolonged and jovial laugh, heard at a considerable distance. Several males pursue a female, reach her, and to prove the force and truth of their love, bow their heads, spread their tails, and move sideways, backwards and forwards, performing such antics as might induce any one witnessing them, if not of a most morose temper, to join his laugh to theirs. The female flies to another tree, where she is constantly followed by one, two, or even half a dozen of these gay suitors, and where again the same ceremonies are gone through. No fightings occur, no jealousies exist among these beaux, until a marked preference is shown to some individual; when the rejected proceed in search of another female. In this manner all the golden-winged woodpeckers are soon happily mated. Each pair immediately proceed to excavate the trunk of a tree, and finish a hole in it sufficient to contain themselves and their young. They both work with great industry and apparent pleasure. Should the male, for instance, be employed, the female is close to him, and congratulates him on the removal of every chip which his bill sends through the air. While he rests he appears to be speaking to her on the most tender subjects, and when fatigued is at once assisted by her. In this manner, by the alternate exertions of each, the hole is dug and finished. They caress each other on the branches, climb about and around the tree with apparent delight, rattle with their bill against the tops of the dead branches, chase all their cousins the red-heads, defy the purple-grackles to enter their nest, feed plentifully on ants, beetles, and larvæ, cackling at intervals, and ere two weeks have elapsed, the female lays either four or six eggs, the whiteness or transparency of which are doubtless the delight of her heart. If to raise a numerous progeny may contribute to happiness, these woodpeckers may be happy enough, for they have two broods each season. Even in confinement the golden-winged woodpecker never suffers its naturally lively spirit to droop. It feeds well, and by way of amusement will contrive to destroy as much furniture in a day as can well be mended by a different kind of workman in two. Therefore, kind reader, do not any longer believe that woodpeckers, I mean those of

Scansores. America, are such stupid, forlorn, dejected, and unprovided-for beings, as they have hitherto been represented."¹

The other species to which we have above alluded is the beautiful ivory-billed woodpecker (*Picus principalis*, Linn.), of which the broad extent of dark and glossy plumage, with the well-defined snowy markings of the neck and wings, relieved by the rich tracery of the carmine crest, and brilliant yellow eye, in some way so reminded the enthusiastic Audubon of the noble productions of a great Flemish painter, that whenever he saw one of these gorgeous birds flying from tree to tree, he would exclaim, "There goes a Vandyke." The ivory-billed woodpecker confines its rambles to a comparatively small portion of the United States, and is never observed in the middle portions of the Union, where the nature of the wood does not appear to suit its habits. "Descending the Ohio," says Mr Audubon, "we meet with this splendid bird for the first time near the confluence of that beautiful river and the Mississippi; after which, following the windings of the latter, either downwards towards the sea, or upwards in the direction of the Missouri, we frequently observe it. On the Atlantic coast, North Carolina may be taken as the limits of its distribution, although now and then an individual of the species may be accidentally seen in Maryland. To the westward of the Mississippi, it is found in all the dense forests bordering the streams which empty their waters into that majestic river from the declivities of the Rocky Mountains. The lower parts of the Carolinas, Georgia, Alabama, Louisiana, and Mississippi, are however the most favourite resorts of this bird, and in those states it constantly resides, breeds, and passes a life of peaceful enjoyment, finding a profusion of food in all the deep, dark, and gloomy swamps dispersed throughout them. I wish, kind reader, it were in my power to present to your mind's eye the favourite resort of the ivory-billed woodpecker. Would that I could describe the extent of those deep morasses, overshadowed by millions of dark gigantic cypresses, spreading their sturdy moss-covered branches, as if to admonish intruding man to pause and reflect on the many difficulties which he must encounter should he persist in venturing farther into their almost inaccessible recesses, extending for miles before him, where he would be interrupted by huge projecting branches, here and there the massy trunk of a fallen and decaying tree, and thousands of creeping and twining plants of numberless species! Would that I could represent to you the dangerous nature of the ground, its oozing, spongy, and miry disposition, although covered with a beautiful but treacherous carpeting, composed of the richest mosses, flags, and water-lilies, no sooner receiving the pressure of the foot than it yields, and endangers the very life of the adventurer, whilst here and there, as he approaches an opening, that proves merely a lake of black, muddy water, his ear is assailed by the dismal croaking of innumerable frogs, the hissing of serpents, or the bellowing of alligators! Would that I could give you an idea of the sultry pestiferous atmosphere, that nearly suffocates the intruder during the meridian heat of our dogdays, in those gloomy and horrible swamps! But the attempt to picture these scenes would be vain. Nothing short of ocular demonstration can impress any adequate idea of them.

"The flight of this bird is graceful in the extreme, although seldom prolonged to more than a few hundred yards at a time, unless when it has to cross a large river, which it does in deep undulations, opening its wings at first to their full extent, and nearly closing them to renew the propelling impulse. The transit from one tree to another, even should the distance be as much as a hundred yards, is performed by a single sweep, and the bird

appears as if merely swinging itself from the top of the Scansores. one tree to that of the other, forming an elegantly curved line. At this moment all the beauty of the plumage is exhibited, and strikes the beholder with pleasure. It never utters any sound whilst on wing, unless during the love season; but at all other times, no sooner has this bird alighted, than its remarkable voice is heard, at almost every leap which it makes, whilst ascending against the upper parts of the trunk of a tree, or its highest branches. Its notes are clear, loud, and yet rather plaintive. They are heard at a considerable distance, perhaps half a mile, and resemble the false high note of a clarionet. They are usually repeated three times in succession, and may be represented by the monosyllable, *pait, pait, pait*. These are heard so frequently, as to induce me to say that the bird spends few minutes of the day without uttering them; and this circumstance leads to its destruction, which is aimed at, not because (as is supposed by some) this species is a destroyer of trees, but more because it is a beautiful bird, and its rich scalp, attached to the upper mandible, forms an ornament for the war-dress of most of our Indians, or for the short pouch of our squatters and hunters, by all of whom the bird is shot merely for that purpose.

"Travellers of all nations are also fond of possessing the upper part of the head and the bill of the male; and I have frequently remarked, that on a steam-boat's reaching what we call a *wooding-place*, the *strangers* were very apt to pay a quarter of a dollar for two or three heads of this woodpecker. I have seen entire belts of Indian chiefs closely ornamented with the tufts and bills of this species, and have observed that a great value is frequently put upon them. The food of this species consists principally of beetles, larvæ, and large grubs. No sooner, however, are the grapes of our forests ripe, than they are eaten by the ivory-billed woodpecker with great avidity. I have seen this bird hang by its claws to the vines, in the position so often assumed by a tit-mouse, and, reaching downwards, help itself to a bunch of grapes with much apparent pleasure. Persimons are also sought for by them, as soon as the fruit becomes quite mellow, as are hag-berries. The ivory-bill is never seen attacking the corn, or the fruit of the orchards, although it is sometimes observed working upon and chipping off the bark from the belted trees of the newly-cleared plantations. It seldom comes near the ground, but prefers at all times the tops of the tallest trees. Should it, however, discover the half-standing broken shaft of a large dead and rotten tree, it attacks it in such a manner as nearly to demolish it in the course of a few days. I have seen the remains of some of these ancient monarchs of our forests so excavated, and that so singularly, that the tottering fragments of the trunk appeared to be merely supported by the great pile of chips by which its base was surrounded. The strength of this woodpecker is such that I have seen it detach pieces of bark seven or eight inches in length at a single blow of its powerful bill, and by beginning at the top branch of a dead tree, tear off the bark, to an extent of twenty or thirty feet, in the course of a few hours, leaping downwards with its body in an upward position, tossing its head to the right and left, or leaning it against the bark to ascertain the precise spot where the grubs were concealed, and immediately after renewing its blows with fresh vigour, all the while sounding its loud notes, as if highly delighted.

"When wounded and brought to the ground, the ivory-bill immediately makes for the nearest tree, and ascends it with great rapidity and perseverance, until it reaches the top branches, when it squats and hides, generally with

¹ *Ornithological Biography*, vol. i. p. 191.

Scansores. great effect. Whilst ascending, it moves spirally round the tree, utters its loud *pait, pait, pait*, at almost every hop, but becomes silent the moment it reaches a place where it conceives itself secure. They sometimes cling to the bark with their claws so firmly, as to remain cramped to the spot for several hours after death. When taken by the hand, which is rather a hazardous undertaking, they strike with great violence, and inflict very severe wounds with their bill as well as claws, which are extremely sharp and strong. On such occasions, this bird utters a mournful and very piteous cry.¹

A few species in which the bill is obviously arched form the genus *COLAPTES* of Mr Swainson. They seem, moreover, distinguished by the broad, bright-coloured shafts of the quill-feathers. Such is the gold-winged woodpecker (*P. auratus*) already alluded to. These birds *perch* more frequently than the genuine woodpeckers, that is, grasp or encircle the smaller branches, and they also often feed upon the ground. A Brazilian species is even named *P. campestris*, from its habit of searching about in fields and plains for insects in the dung of cattle, or on ant-hills, where it finds an ample supply of favourite food. This form occurs also in Africa. Certain three-toed species were formed into the genus *PICOIDES* by Lacepede. (Plate CCCXCV. fig. 3.)

The genus *YUNX* of Linn., containing the wrynecks, remarkable for their beautifully brindled plumage, is of very limited extent. The sole European species (*Yunx torquilla*) is in Britain a rare but regular summer bird of passage, breeding in hollow trees, laying numerous eggs, and feeding on insects. The genus *PICUMNUS* of Temm. is nearly allied, but is distinguished by its extremely short tail. Example, *P. abnormis*, Temm. *Pl. Col.* 371, fig. 3, which comes from Java. *Picus minutus*, which some authors place here, is by others regarded as a *Yunx*.

In the genus *CUCULUS* of Linn. were originally placed a number of different insectivorous birds, commonly called cuckoos, which agreed in the general form of the feet, the lengthened tail, the bill of medium size, rather deeply cleft, somewhat compressed, and slightly curved. But they have since been formed into numerous minor groups, the most marked and conspicuous of which we shall here briefly notice.

The true cuckoos, genus *CUCULUS*, Cuv., have the bill of moderate strength, the tarsi short, and the tail of ten feathers. As an example, we name our common British species, *C. canorus*, so remarkable for its singular and somewhat anomalous habit of depositing its eggs in the nests of other birds, a fact now so well known, and so frequently recorded, that we need not here dilate upon the subject, however curious in itself. The nest of the hedge-sparrow (*Accentor modularis*) is that most usually chosen in the south of England,—that of the yellow-hammer (*Emb. citrinella*), the wagtail (*Mot. alba*), and the

meadow titlark (*A. pratensis*), being, however, likewise Scansores. devoted to the purpose. "In Northumberland," says Mr Selby, "constant experience tells me, that the nest of the last-mentioned bird is the one almost always chosen. Taking advantage of the absence of its dupe during the time of laying (which generally occupies four or five days), the cuckoo deposits its egg among the rest, abandoning it from that moment to the care of the foster-parent. As the same period of incubation is common to both birds, the eggs are hatched nearly together, which no sooner takes place than the young cuckoo proceeds instinctively to eject its young companions and any remaining eggs from the nest. To effect this object, it contrives to work itself under its burden (the back at this early age being provided with a peculiar depression between the shoulders), and shuffling backwards to the edge of the nest, by a jerk rids itself of the incumbrance; and this operation is repeated, till the whole being thrown over, it remains sole possessor. This particular tendency remains for about twelve days, after which the hollow space between the shoulders is filled up; and when prevented from accomplishing its purpose till the expiration of that time, as if conscious of inability, it suffers its companions to remain unmolested."²

Various supposed reasons have been assigned for this anomalous, and we might almost say unnatural, instinct. Some have attributed it to the displacement of certain viscera (the gizzard is said to be situate farther back than in most other birds), which unfits them for the purposes of incubation, while others imagine that the early period at which cuckoos migrate from this country (they are generally off by the beginning of July) makes it necessary that they should leave their offspring to the care of foster-parents.³ But anatomical investigation has not proved any thing sufficiently peculiar in their structure to warrant the first conclusion; and as to the second, it seems to us not so much a deduction from a regulating and causative fact in their history, as the statement of an additional circumstance which renders that history still more singular, and which naturally leads to the question, not easily answered, of why do they migrate so early?⁴ In short, we know nothing at all about the matter, further than that the cuckoo of Europe, like the cow-bunting of America, always lays eggs, but never hatches them. The same custom is alleged, we think upon a narrow and ill-considered generalization, to characterize the other kinds of cuckoo. It may be a practice common to several species, but the rare black and white spotted cuckoo (*Cuculus Pisanus*, Gm., an odd name for an African bird, which happened once upon a time to visit Tuscany) is stated by the authors of the *Storia degli Uccelli* to have built a nest in the woods of Pisa, and reared four young ones. This species is extremely rare in Europe. It is known, however, in the Genoese territory,⁵ and the young have been occa-

¹ *Ornithological Biography*, i. 341.

² *British Ornithology*, vol. i. p. 398.

³ *British Ornithology*, vol. i. p. 399.

⁴ Besides, in Italy and other southern parts of Europe, this migration does not take place till September, and yet the habits of the bird are precisely the same. "Quelli uccellini," says Savi, "nel covo de' quali il cuculo ha lasciato l'uovo, non vi fanno attenzione; come uno de' loro seguitano a covarlo, e quando è nato imboccano e custodiscono il piccolo cuculo, con lo stesso amore, e con la cura medesima de' figli propri. Ma ben presto egli paga d'ingratitude le premure dell'amorosa sua balia: crescendo molto più de' compagni, dopo poco tempo il nido è per lui troppo stretto: allora ricorre a un barbaro espediente per procurarsi un alloggio più comodo: " &c.... " Ripete quest' operazione successivamente, in ragione che cresce, e che gli altri compagni lo incomodano, di modo che alla fine rimane solo nel nido usurpato. Così quei miseri uccelli che costruirono il nido e che han fatto da balia al cuculo, sono da lui privati ad uno ad uno di tutti i figli." Regarding the movements of the parent bird in Italy, he observes, "E uccello migratorio: arriva nell' Aprile, e parti in Settembre. Appena arriva comincia a cantare, e quantunque il suo verso non abbia alcuna varietà, non ostante la voce essendo dolce e rotonda, si sente con piacere. Grandissimo è il numero che ne rimane in Toscana: non vi è bosco in monte o in piano, che in primavera ed in estate, non risuoni dal *cu cu, cu cu*, di questo uccello. Nel Settembre comincia a muoversi per emigrare: allora in alcuni anni se ne vede passare una quantità grandissima per la pianura Pisana. Nel Settembre del 1823, gli alberi dello stradone che da Pisa va al Parco Reale di S. Rossore, attraversando vastissime praterie, ne furono pieni per una diecina di giorni. Volavano i cuculi da una pianta all'altra, andavano a posarsi un poco sul prato, ritornavano sugli alberi, ma di là non si allontanavano, benchè continuamente fossero molestati dai non pochi cacciatori che vi erano accorsi. Questi uccelli volano con grande agilità, e spesso, particolarmente andando a posarsi, senza muovere le ali, come sogliono fare i Falchi." (*Ornitologia Toscana*, t. i. p. 152.)

⁵ Calvi, *Catalogo d'Ornitologia di Genova*, p. 55.

Scansores. sionally killed in the south of France.¹ Many beautiful cuckoos are found in foreign countries.

Those of North America belong to the genus *Coccyzus* of Vieillot, and are distinguished by a greater length of tarsus. (Plate CCCXCV. fig. 4.) They seem to delight more in deep woody solitudes than the true cuckoos, the latter being often found on hilly pastures and open heathy ground, if fringed with wood. A stranger who visits the United States for the purpose of examining their natural productions, and passes through the woods in May or June, will sometimes hear, as he traverses the borders of deep, retired, high-timbered hollows, an uncouth guttural sound. He will frequently hear this without being able to discover the source from which it comes, as the yellow-billed cuckoo (*Coccyzus Americanus*) is both shy and solitary, and always seeks the thickest foliage for concealment. This bird is of a grayish brown, with bronzed reflections, beneath white, the inner vanes of the primaries reddish cinnamon colour, the lower mandible white, and the length from bill to tail about twelve inches. Considerable discussion has taken place among philologists regarding the native languages of North and South America,—remarkable, we are led to understand, for their great number and striking dissimilarity. We know not what may be the intention of the yellow-billed cuckoo in speaking as he does, or whether he is distinctly comprehended by his neighbours; but the following is Mr Nuttall's account of the elements of his conversation: "The male frequently betrays his snug retreat by his monotonous and guttural *how how how how*, or *koo koo koo koo*, and *ko kuk, ko kuk, koo koo koo kuk, koo ko koo, koo ko koo*, uttered rather plaintively, like the call of a dove. At other times the *how how how how*, and *'th 'th 'th 'th 'tak*, or *'kh 'kh 'kh 'kh 'hak, how how how how*, beginning slow, rises, and becomes so quick as almost to resemble the grating of a watchman's rattle, or else, commencing with this call, terminates in the distant cry of *how how how*." From this peculiar iteration (Shakspeare would have called it "damnable," a word we sometimes hear in pulpits, but ourselves but seldom use), the species in question has received the name of *how*-bird, and we do not wonder at it. It may be satisfactory to know, that the St Domingo cuckoo (*C. Dominicus*, Nut.) although it sometimes cries both *how how how how* and *'kh 'kh 'kh 'kh 'kh 'kak*, yet often utters, in a raucous guttural voice, especially preceding rain, a word which sounds like *orrattottoo* or *worrattottoo*, exactly which has not been yet determined.

In the genus *CENTROPUS* of Illiger the bill is compressed and carinated, and the nail of one of the hind toes is long, straight, and pointed, like a lark's. The tail is greatly elongated. The species are native to India and Africa, where they build in hollow trees, and feed on locusts and other insects. Such are *Cuculus Egyptius*, *Senegalensis*, *Bengalensis*, &c. The genus *LEPTOSOMUS* of Vieillot is constituted by the great Madagascar cuckoo (*C. cafer*, Lath.—*Lep. viridis*, Vieil.), the female of which, as described by Buffon, is according to M. Lesson a distinct species—*Lept. crombus*. These birds are said to be frugivorous. (Plate CCCXCV. fig. 5.)

In the genus *INDICATOR*, Vail., the bill is short, high, almost conical. (Plate CCCXCV. fig. 6.) The tail consists of twelve feathers, and is somewhat graduated, and at the same time a little forked. The skin is described to be so hard and tough as to resist the assaults of most hymenopterous insects; but bees, which they incessantly torment, are said to sting them in the eyes. The species, few in number, are known by the name of honey-guides, and inhabit Africa.

The one mentioned by Sparrman is said to attract the notice of the Dutch and Hottentots by a shrill cry of *cher, cher*; and when it perceives itself observed, it flutters onwards to the hive of a wild bee, in hopes of partaking of the plundered honey. "I have had frequent opportunities," he observes, "of seeing this bird, and have been witness to the destruction of several republics of bees, by means of its treachery. I had, however, but two opportunities of shooting it, which I did, to the great indignation of my Hottentots." It may be here noticed, we hope without offence, that naturalists themselves seem not seldom to belong to that *irritable genus*, of which poets are usually supposed to form the greater portion. Though Dr Sparrman asserts that he was a frequent eye-witness of the curious instinctive habits of the honey-guide, yet Vaillant doubts if that traveller ever saw the bird at all. He says that the account is merely a repetition of a fable believed and repeated by credulous people at the Cape, and that it is erroneous to suppose that the bird seeks to draw man after it for the purpose of sharing the plundered sweets, the fact being, that it calls not the man, but that the latter knows, by attending to the cry of the honey-guide while searching for its natural food, that he will be sure ere long to find the stores of the industrious insect. According to Bruce, the *moroc*, for so this singular species is sometimes named, occurs in Abyssinia; and he too throws discredit on Sparrman's statements,—his own being but ill received by not a few. However, Sir John Barrow, a careful and accurate inquirer, though not a professed naturalist, confirms it by stating that people in the interior of the South of Africa are too well acquainted with the *moroc* to have any doubts, either as to the bird itself, or its singular instinctive habits.

The *Barbacous* of Vaillant (genus *MONASA*, Vieil.) are South American birds, with rather conical elongated bills, slightly arched towards the tip, and furnished at the base with setaceous feathers. (Plate CCCXCV. fig. 7.) Such are *Cuc. tranquillus* and *tenebrosus* of the older systems, and the *Bucco albifrons* of Spix. We believe they are insectivorous. The *Malcohas* of Vaillant, again (genus *PHÆNICOPHÆUS*, Vieil.), are Asiatic species, of which the most anciently known is native to Ceylon. (Plate CCCXCVI. fig. 1.) We here place the *Cuculus curvirostris* of Shaw, Latham's red-headed cuckoo, *C. pyrrhcephalus* of Forster, &c. and certain recent species described by Dr Horsfield and Sir Thomas Raffles. The preceding groups were all regarded as cuckoos by the older authors.²

The genus *SCYTHROPS* of Latham, however, has a much stronger bill than any of these, marked by two slight longitudinal furrows. There is a naked space around the eye, and the nostrils are rounded. Only a single species is yet known, *Sc. Novæ Hollandiæ*, Lath., sometimes called the channel bill, a most peculiar looking bird, of the size of a crow, gray above, beneath dingy white. (Plate CCCXCVI. fig. 2.) In its bill it almost assimilates to the toucans, but its tongue is simple. Though it is mentioned both by White and Phillips, we know as yet but little of its habits. It occurs in New Holland, where it is sometimes seen in small flocks, but more usually in pairs, frequenting trees, and uttering during flight a loud and screaming cry, not unlike the crowing of a cock. Its food is said to consist both of fruits and insects. It also occurs in the Celebes, where its voice presages rain.

The genus *Bucco* of Linn., is characterized by a thickish conical beak, bulged laterally from the base, and furnished with five fasciculi of barbs directed forwards. The wings

¹ Roux, *Ornithologie Provençale*, p. 105.

² For the various modifications of form exhibited by the Cuculidæ, and the numerous minor groups which have thence resulted, see M. Lesson's *Traité d'Ornithologie*, and a recent paper by Mr Swainson in the *Magazine of Zoology and Botany*.

Scansores. are short, and the flight heavy. The species feed on fruits and insects, and occasionally attack small birds. They build their nests in hollow trees. Cuvier divides them into three minor groups. The *Barbicans* of Buffon (*POGONIAS*, Illiger) have one or two strong teeth on each side of the upper bill, of which the ridge is arched and blunt. The barbs are very strong. (Plate CCCXCVI. fig. 3.) The species occur in Africa and India, and are more frugivorous than their congeners. Example, *P. sulcirostris*, Leach, *Zool. Misc.* xi. 76. The *Barbus* (genus *Bucco*, as restricted) have the bill simply conic, slightly compressed, the culmen blunt, and a little raised about the centre. The species live in pairs during the breeding season, and in small flocks at other times. They occur in both continents, and are adorned with lively colours.—*Bucco grandis*, *viridis*, *flavifrons*, &c. Lastly, the *Tamatias*, genus *TAMATIA*, Cuv., have the bill more elongated and compressed, with the extremity of the upper mandible curved downwards. Their thick heads, large bills, and short tails, give them a stupid aspect. They inhabit South America, feed on insects, and are of solitary habits. Example, *T. melanoleucos*, *melanotis*, &c. They are known by the English name of *puff-birds*; and Mr Swainson describes them as sitting for hours together on a dead or withered branch, from which they dart from time to time on such unwary insects as approach within their reach. He adds, that the hermit-birds (genus *Monasa*), already mentioned, do the same, and frequently rise up perpendicularly into the air, making a swoop, and returning again to their former station. Similar manners belong to the jacamars, though their flight is weaker.

In the genus *TROGON* the bill is also bearded, but short, and broader than high, the upper edge rounded. Their little feet are often feathered almost to the toes, and their soft, full, lax plumage, and lengthened tails, bestow upon the species a peculiar aspect. (Plate CCCXCVI. fig. 4.) These birds abound in South America, where they conceal themselves in the central solitudes of umbrageous forests, and, except during the breeding season, dwell insulated and alone. They will sit motionless for half a summer's day, often upon a withered branch, and if not concealed by some accidental intervening mass of foliage, they fall an easy prey to the keen-eyed hunter, who eagerly searches for birds not less remarkable for the delicacy of their flesh than the beauty of their plumage. During the morning and evening hours, Mr Swainson informs us, they become more active; venturing at these times into the open parts of the forest, and, taking a shady station, dart upon winged insects, particularly beetles. At other times they feed upon fruits, especially the rich purple berries of the different *melastomæ*, "at which," says Mr Swainson, "they invariably dart, precisely as if they were insects capable of getting away." It has been remarked by the woodland hunters, that the skins of these birds are of such delicate texture as to be with difficulty preserved in a natural or complete condition. It is probably for this reason that in museums they exhibit a heavy, shapeless aspect, redeemed, it is true, by the gorgeous colours or metallic splendour of their plumage. The most magnificent of the genus is the quezal or golden trogon (*T. pavoninus*, Temm.), a rare and remarkable species, of which neither delineation nor description can convey an adequate idea. The greater proportion of the plumage is apparently composed of burnished gold. The head ornamented by a brilliant crest of decomposed barbs, the wing-coverts falling in flakes of golden green over the deep purplish-black of the primary and secondary quill-feathers, the rich carmine of the lower parts bestowing a warmth and depth of effect which no Venetian painter ever equalled, and the long waving and

highly metallic feathers of the tail-coverts, extending about three times the length of the whole body, present a combination of beauty almost unexampled in the feathered tribes. The first specimens seen in this country were brought, we believe, by Mr Schenley from Vera Paez, in central America. They are celebrated in the Mexican mythology, and are much sought after as head-gear by the Peruvian damsels. Trogons, of other kinds, occur also in the Indian islands, and the warmer continental regions of the old world.¹

The genus *CROTOPHAGA*, Linn., is recognised by its thick, compressed, arched bill, without dentation, elevated, or surmounted by a vertical cutting crest. (Plate CCCXCVI. fig. 5.) The species called *anis* or keel-birds inhabit South America and the West Indies. They are of a familiar and gentle disposition in confinement, easily tamed, and may be taught to speak. Their plumage is black, with metallic reflections. They build in bushes (some say upon the ground), and several pairs will lay and hatch together in the same nest, which is made of size proportioned to the partnership. They feed on insects, keep much upon the ground, where they also attack maize and rice. M. Lesson says that *C. major* dwells more habitually on large trees, while *C. minor* prefers the savannahs and marshy meadows. Mr Swainson never saw the common ani perch on any thing higher than a bush.

The genus *RAMPHASTOS*, Linn., is distinguished by its enormous bill, which in some instances is almost equal in size to the body. It is, however, extremely light, and cellular within, arched towards the extremity, and irregularly toothed along the margins. The tongue is long, narrow, and barbed on each side, like a feather. These birds, commonly called toucans, inhabit South America, where they live habitually in woods, and prey on fruits, eggs, and new-hatched birds. The species are pretty numerous, and almost all distinguished by brilliant colouring, which however is somewhat too strongly contrasted, and consequently deficient in that fine gradation or harmonious blending which beautifies less gorgeous tribes. We have never chanced to see them in the living state, but in museums they present a somewhat awkward aspect, from their disproportioned bills, short feet, and lengthened tails. Their sense of smell is said to be extremely acute,—a faculty by some attributed to an extended ramification of nerves within the nasal portion of the bill. The genus is now divided into two: 1st, The toucans proper (genus *RAMPHASTOS*, Plate CCCXCVI. fig. 6), which have the largest bills, with the ground colour of the plumage usually black, the throat, breast, and rump being more gaily ornamented with white, yellow, and red. 2dly, The *aracaris* (genus *PTEROGLOSSUS*, Illiger, Plate CCCXCVI. fig. 7), in which the bill is smaller than the head, and the ground colour of the plumage generally green, with red or yellow on the throat and breast. A live specimen of *Ramphastos tucanus*, of which the manners have been described by Mr Vigors, was extremely fond of fruit, both fresh and dried. These it generally held for a short time in the extremity of the bill, touching them with apparent delight with its slender feathered tongue; and then tossing them into its throat by a sudden upward jerk. Its tendency to prey on animals was, however, strongly evinced by the excitement produced by the sight of a living bird; and the carnivorous propensities of another individual are curiously related by Mr Broderip. A goldfinch (though, we repeat, we approve not of the fact), introduced into the toucan's cage, was seized and compressed so suddenly, that the poor little songster had only time to utter a short squeak before it was dead, with its bowels protruding. The toucan then hopped with it to

¹ Mr Gould has published a *Monograph of the Trogonidæ*, with sumptuous coloured plates.

Scansores. another perch, and began to strip off its feathers. When it was nearly naked, it broke the bones of the wings and legs, taking them in its bill, and giving them a strong lateral wrench. Having reduced the little victim to a shapeless mass, it first swallowed the viscera, and then the remaining parts, piece after piece, not even rejecting the legs and bill. Mr Broderip adds, that he has sometimes observed it return its food from its crop, and swallow it again, after a second mastication.

The genus *PSITTACUS*, Linn., comprehending the almost innumerable tribe of parrots, lorries, parrakeets, maccaws, and cockatoos, has the bill thick, hard, solid, rather short, rounded on all its outlines, deep, curved, and generally sharp-pointed. The tongue is almost always thick, round, and fleshy, and the lower larynx furnished on each side with three peculiar muscles, which probably contribute to the great facility with which these birds acquire the articulate intonation of the human voice. Their strong and powerful jaws are brought into action by muscles more numerous than usual. Their natural food consists of fruits and seeds. They climb trees with the greatest facility, and suspend themselves indifferently from feet or bill. Their voices are harsh and discordant, their forms often elegant, their plumage usually of great richness. They form indeed a magnificent family, abundant in almost every region of the torrid zone, and in the new world extending from the shores of the Ohio to the Straits of Magellan,—thus presenting a vast and varied assemblage of species from every country of the world, excepting the comparatively cold and cloudy clime of Europe. The gorgeous maccaws are characteristic of South America, the cockatoos of New Holland and the Asiatic islands, the lorries of the East Indies and the Moluccas; whilst several groups of parrots, parrakeets, &c. are widely distributed over various regions of the earth. Above two hundred different kinds are known to naturalists.

It was the opinion of Buffon that none of the parrot tribe extended either northwards or southwards beyond the twenty-fifth degree, on either side of the equator. Having apparently resolved, *a priori*, on these lines of circumvallation, he despised, as Pennant observed, the authority of the Dutch navigator Spilbergen, who was eye-witness to the woods of Terra del Fuego, the very southern boundary of the Straits of Magellan, in south latitude 44° , being full of them. He might also have cited the evidence of Captain Hood, who saw a parrot at Port Famine; and of Commodore Byron, who notwithstanding the coldness of the climate observed parrots innumerable in the woods of that same harbour. They were found by Captain Cook in New Zealand, by Captain Furneaux at Van Diemen's Land, and by the learned Forster in the raw wet climate of Dusky Bay. The emerald parrot, *Psitt. smaragdinus*, Gmel., was lately seen in great numbers by Captain King, among thick underwood, in the Straits of Magellan, south latitude $53\frac{1}{2}^{\circ}$; and others are well known to occur in Macquarie Island, which lies in latitude $54\frac{1}{4}^{\circ}$ south. A species inhabits North America, extending even beyond the Illinois River to the neighbourhood of Lake Michigan, in the forty-second degree of north latitude. It was seen by Alexander Wilson in the month of February, flying in flocks along the banks of the Ohio, during a storm of snow, and yet in full rejoicing cry. These, and many similar facts, are now well known to naturalists.

The modern subdivisions of this great natural family are too numerous and minute to be here recorded.¹ We must therefore satisfy ourselves with a brief indication of the principal groups. We presume nobody at this time of day, under the pretence of *popular* reading, desires to

be edified by anecdotes of parrots, so we shall devote the little space we can afford for miscellaneous matters, to a few notices of some of the species which have bred in Europe. Of these we may here mention, as the principal, the great blue and buff maccaw (*P. ararauna*); the gray parrot (*P. erythacus*); the cinciale, ring-necked, and pavouan parrakeets (*P. cinciale*, *torquatus*, *Guianensis*); and the black-capped or Philippine lory (*P. tricolor*). The general belief is that the parrot tribe will not breed in Europe; but knowing several instances to the contrary, we wish to impress upon the public the probability that many more would occur were the experiment tried with frequency and judgment.

The gorgeous maccaws form the genus *MACROCERCUS* of Vieillot. The face is either naked, or merely striped with feathery lines. The tail is very long, wedge-shaped, and sharp-pointed. (Plate CCCXCVII. fig. 1.) These birds, the largest and most magnificent of the parrot tribe, inhabit South America. The great scarlet maccaw (*Psittacus aranga*, Lath.), when in perfect plumage, sometimes measures above three feet in length, the tail of course included. The prevailing plumage is scarlet, as its name implies, the wings blue, the wing-coverts varied with yellow, the cheeks white and wrinkled. It is certainly a sumptuous creature, but after all rather too like a richly liveried footman,—an association somewhat strengthened by its being so often seen as an inhabitant of lordly mansions, and surrounded by other menial bipeds, almost as gorgeous as itself. Our feelings would no doubt have been different had we ever witnessed their natural evolutions. "It is a grand sight in Ornithology," says Waterton, "to see thousands of aras flying over your head, low enough to let you have a full view of their flaming mantle." How delightful would it have been, on some bright and dewy morning, to have accompanied Lord Anson to view a magnificent rapid in the island of Quibo. A fine river of transparent water there precipitates itself along a rocky channel, forming numerous falls, and the great disrupted rocks which form its boundary on either side are crowned with lofty forest trees. "While the commodore and those who were with him attentively viewing the place, were remarking the different blendings of the waters, the rocks, and the woods, there came in sight as it were still more to heighten and animate the prospect, a prodigious flight of maccaws, which hovering over this spot, and often whirling and playing on the wing about it, afforded a most brilliant appearance by the glittering of the sun upon their varied plumage; so that some of the spectators cannot refrain from a kind of transport when they recount the complicated beauties which occurred at this extraordinary water-fall." The blue and yellow species (*P. ararauna*, Linn.) is little inferior to the preceding, either in size or sumptuousness. It is less common, and seems to have been first described by Aldrovandus, from a specimen which he saw in the palace of the Duke of Mantua. It is said to be also less easily reclaimed as a domestic bird,—yet we have not seldom enjoyed the society of a very fine example which makes its way familiarly (such is its custom in the afternoon) amid the varied horticultural produce which graces the *dessert* of Dr Neill. Many other splendid species are described and figured in the works of naturalists.

In the genus *ARATINGA* of Spix, the bill is slender, dentated; the orbits of the eyes naked, the cheeks rarely so; the tail lengthened, wedge-shaped, the intermediate feathers prolonged. The species are peculiar to the new world. Such are *Ar. Caroline-Augusta*, *chrysocephalus*, &c. To these the genus *PSITTACARA* of Vigors seems allied, the bill, however, being shorter and stouter, and

¹ The most complete and scientific treatises with which we are acquainted on the parrot tribe are,—*Conspectus Psittacorum*, ab H. Kuhl, Ph. Dr. &c. in *Nova Acta Acad. Nat. Cur.* tom. x. p. 1; and Wagler's *Monographia Psittacorum*.

Scansores. the upper mandible compressed at the tip. The head is feathered, but the orbits are naked. The species, such as *P. squamosus*, &c. are likewise natives of South America.

The genus *PALÆORNIS* of Vigors has the bill rather thick, the culmen of the upper mandible rounded, the lower broad, short, emarginate. The middle feathers of the tail are greatly lengthened. The most anciently known of the parrot race belong to this genus, such as the Alexandrine parakeet, and other long-tailed species, distinguished by their elegance of form, their ruby-coloured bills, their semicircled necks, and the rich verdure of their plumage. The one just named is native to India and Ceylon, and derives its designation from the fact, real or supposed, of its having been first transported from Asiatic countries by Alexander the Great. Its most distinguishing characters consist in the broad black patch which occupies the fore-part of the throat, and extends laterally in two narrow processes on each side of the neck; a black line stretches from the base of the beak to the eyes, and there is a deep purplish-red patch at the base of the wings. Its bill is larger than that of the rose-coloured parakeet (*P. torquatus*), which, however, it greatly resembles in its general aspect. The last-named species is widely spread over India, and as far eastward as Manilla. It appears, indeed, to be identical with another species extremely abundant on the African coasts, and well known in France under the title of *perruche de Senegal*. In so far as any conclusion can be drawn from the vague and brief descriptions handed down by ancient writers, it would appear that this species was, as it still continues to be, more frequent in the days of antiquity than any of its congeners. No allusion is made by these authors to those specific marks by which the Alexandrine parakeet is so clearly distinguished, and the general description applies very closely to the rose-necked kind. That the latter was extensively known, and held in high esteem on account of the brilliancy of its plumage, the docility of its manners, and its successful imitative powers, is proved by innumerable passages in the classical writers of antiquity, more especially from the earliest times of the Roman empire, to a very late period of its annals.¹ The Alexandrine parrot is generally supposed to have been brought to Europe from the island of Ceylon, the ancient Taprobane. In the reign of Nero, the Romans introduced other species from different quarters of Africa.² They were highly prized by that luxurious people, who lodged them in superb cages of silver, ivory, and tortoise-shell; and the price of a parrot in those days frequently exceeded that of a slave.³ Nor did Ovid think it beneath him to write a lengthened elegy on the death of Corinna's favourite,—a bird which, in the love it bore its mistress, seems to have emulated that of the dying Greek for his country:—

Clamavit moriens lingua, Corinna, Vale.⁴

In the same group is generally included that beautiful and richly varied species from the Molucca Islands, called the blue-bellied parakeet, *Ps. cyanogaster*, Shaw. Its tongue, in common with that of several New Holland par-

rakeets, is finely ciliated at the tip on either side. Hence Scansores. the formation in their favour of Mr Vigors's genus *TRICHOGLOSSUS*. Vaillant, during his residence at the Cape, had an opportunity of studying the manners of a pair of the species just named, which had been imported from Amboyna. They bred during their confinement in the menagerie of M. Van Bletenberg, then governor of the Cape. The female deplored her beautiful breast, and after having collected the feathers into a heap, deposited two round white eggs, on which she sat most assiduously, the male feeding her at intervals, by disinterestedly disgorging what he had swallowed, and presenting the same to his spouse. The young were produced at the end of nineteen days, and in the space of a few more became covered with a gray cinereous down, which was by degrees succeeded by green feathers on the body, and by blue ones on the head. At the end of three weeks they left the nest, and perched upon the neighbouring sticks, where the male and female fed them in concert, as above described, after the manner of pigeons. The parent birds continued to tend them in this manner for six months, and often afforded a very interesting scene,—the young being frequently seated beyond the female, and the male not being able to reach them, first presented the food to his mate, who immediately delivered it to her young. These, though of different sexes, were perfectly alike till the first moulting, at which time red feathers bordered with green began to appear upon the breast, and the male became distinguished by the blue patch upon the abdomen.⁵

In the genus *PLATYCERCUS*, Vigors, the tail is broad, depressed, and somewhat rounded. The species inhabit New Holland, and the islands of the South Pacific and Indian Oceans. Examples *Pl. Pennantii*, *Tabuensis*, &c.

Among the *perruches ordinaires* of Cuvier (a portion of the genus *CONURUS*, Kuhl), distinguished by a regularly graduated tail, without any disproportionate prolongation of the central feathers, we have the Carolina parrot of Wilson (*Ps. Carolinensis*, Linn.), a green plumaged bird, with yellow head and neck, the forehead and cheeks orange. Of more than two hundred species now known to belong to the parrot tribe, this is the only one which inhabits the United States, where it is chiefly restricted to the warmer portions,—venturing but rarely beyond Virginia. West of the Alleghanies, however, circumstances induce it to visit much higher latitudes,—so that, following the great valley of the Mississippi, it is seen to frequent the banks of the Illinois, and occasionally to approach the southern shores of Lake Michigan. Straggling parties have even been sometimes observed in the valley of the Juniata, in Pennsylvania; and a flock, to the great surprise of the Dutch inhabitants of Albany, are said to have appeared in that vicinity. This species constantly inhabits and breeds in the southern states, and is so far hardy as to make its appearance, commonly in the depth of winter, along the woody banks of the Ohio, the interior of Alabama, and the banks of the Mississippi and Missouri around St Louis and other places, when nearly all other southern birds have migrated

¹ Ancient writers are unanimous in their statements that parrots came to us first of all from India. Aristotle calls the *Psittacus* "το Ἰνδικόν ὄρνειον;" and Arrian also makes it a native of the East (*Hist. Ind. cap. xv.*). The parrots of Africa became first known to the Romans in the time of Nero. (Plin. *Nat. Hist. lib. vi. c. 29.*) For the classical history of these birds, see Mr Vigors's "Sketches in Ornithology,"—*Zoological Journal*, vol. ii. p. 37.

² See *Zoological Gardens*, vol. ii. p. 96.

³ The splendour of a parrot's cage is thus described by Statius:—

At tibi quanta domus, rutila testudine fulgens,
Connexusque ebori virgarum argenteus ordo,
Argutumque tuo stridentia limina cornu,
Et querulæ jam sponte fores: vacat ille beatus
Carcer.—*Sylv. lib. ii.*

⁴ *Edinburgh Cabinet Library*, Africa, p. 480.
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⁵ Shaw's *General Zoology*, vol. viii. p. 414.

Scansores. before the storms of that inclement season.¹ We may judge of the abundance of this species, even up to a recent period, from the statement of Vaillant, who assures us that he saw a package containing above 6000 skins, which had been sent to a *plumassier* at Paris, for the formation of ornamental dresses.² Mr Audubon, however, informs us that their numbers are now rapidly diminishing, and that in some districts where, twenty-five years ago, they were plentiful, scarcely one is to be seen. "I should think," he adds, "that along the Mississippi there is not now half the number that existed fifteen years ago." With a view to illustrate the natural habits of these birds, we extract the following account from the work of an English gentleman now settled in America. "The Carolina parakeets in all their movements, which are uniformly gregarious, show a peculiar predilection for the alluvial, rich, and dark forests bordering the principal rivers and larger streams, in which the towering cypress³ and gigantic sycamore⁴ spread their vast summits, or stretch their innumerable arms, over a wide waste of moving or stagnant waters. From these, the beech, and the hack-berry,⁵ they derive an important supply of food. The flocks, moving in the manner of wild pigeons, dart in swift and airy phalanx through the green boughs of the forest; screaming in a general concert, they wheel in wide and descending circles round the tall button-wood, and all alight in the same instant, their green lustre, like the fairy mantle, rendering them nearly invisible beneath the shady branches, where they sit, perhaps arranging their plumage, and, shuffling side by side, seem to caress and scratch each other's heads with all the fondness and unvarying friendship of affectionate doves. If the gun thin their ranks, they hover over the screaming, wounded, or dying, and returning and flying around the place where they miss their companions, in their sympathy seem to lose all idea of impending danger. More fortunate in their excursions, they next proceed to gratify the calls of hunger, and descend to the banks of the river or the neighbouring fields in quest of the inviting kernels of the cockle burr,⁶ and probably of the bitter weed,⁷ which they extract from their husks with great dexterity. In the depth of winter, when other resources begin to fail, they, in common with the yellow-bird and some other finches, assemble among the tall sycamores,⁸ and, hanging from the extreme twigs, in the most airy and graceful postures, scatter around them a cloud of down from the pendant balls, in quest of the seeds which now afford them an ample repast. With that peculiar caprice, or perhaps appetite, which characterizes them, they are also observed to frequent the saline springs or *licks*, to gratify their uncommon taste for salt. Out of mere wantonness, they often frequent the orchards, and appear delighted with the fruitless frolic of plucking apples from the trees, and strewing them on the ground untasted. So common is this practice among them in Arkansas territory, that no apples are ever suffered to ripen. They are also fond of some sorts of berries, and particularly of mulberries, which they eat piecemeal in their usual manner, as they hold them by the foot. According to Audubon, they likewise attack the outstanding stacks of grain in flocks, committing great waste; and on these occasions, as well as the former, they are so bold or incautious as readily to become the prey of the sportsman in great numbers. Peculiarity of food appears wholly to influence the visits and residence of this bird, and in plain, champaign, or mountainous countries, they are wholly strangers, though common along the banks of all the intermediate water-courses and lagoons.

Scansores. "Of their manners at the interesting period of propagation and incubation we are not yet satisfactorily informed. They nest in hollow trees, and take little if any pains to provide more than a simple hollow in which to lay their eggs, like the woodpeckers. Several females deposit their eggs in the same cavity; the number laid by each is said to be only three, which are nearly round, and of a light-greenish white.⁹ They are at all times particularly attached to the large sycamores, in the hollow trunks of which they roost in close community, and enter at the same aperture, into which they climb. They are said to cling close to the sides of the tree, holding fast by the claws and bill; and into these hollows they often retire during the day, either in very warm or inclement weather, to sleep or pass away the time in indolent and social security, like the *Rupicolas*¹⁰ of the Peruvian caves, at length only hastily aroused to forage at the calls of hunger. Indeed, from the swiftness and celerity of their aerial movements, darting through the gleaming sunshine, like so many sylvan cherubs, decked in green and gold, it is obvious that their actions as well as their manners are not calculated for any long endurance, and, shy and retiring from all society but that to which they are inseparably wedded, they rove abroad with incessant activity, until their wants are gratified, when, hid from sight, they again relapse into that indolence which seems a relief to their exertions."¹¹

The pavouan parakeet (*Ps. Guianensis*, Lath.) belongs to our present group. This species is native to Cayenne, and the Antilles, where it is not uncommon, often flying about in flocks, frequenting the wooded savannahs, and feeding by preference on the berries of *Erythrina coral-lodendron*. Its length is about twelve inches, its prevailing plumage green, the cheeks and sides of the neck being speckled with bright red, which becomes more conspicuous as the bird advances in age; the smaller wing-coverts are bright red, the greater yellow, and both the quill and tail feathers are dusky yellow beneath. The bill is whitish, the legs and feet gray. We owe to M. Gabriad the following interesting particulars regarding the breeding of a pair of this species in the domestic state. Two cages were prepared for their reception in the month of April. They were placed contiguous, but communicating only by a small door, and the one enjoyed the "blessed light of day," while the other was kept covered, so that no light could enter but by the mutual door. The latter also contained an abundant supply of saw-dust. The birds were placed in the open apartment, which was the larger of the two, and they speedily showed symptoms of tender attachment to each other. They long declined, however, to enter the darkened dwelling, although the female put in her head, withdrew it again, advanced part of her body, then returned tail foremost,—but finally, after several days of hesitation, she entered the mysterious chamber. There she expressed her satisfaction by little kindly cheerful cries, and often called in the male, who exhibited every proof of affection. She soon began to scrape about, and arrange a kind of nest, and on the 18th of May she layed her first egg, succeeded at intervals of three days by a second, third, and fourth,—after which she sat assiduously. The male took no share in the hatching, but he kept constantly close by the nest, as if to cheer her sedentary hours. He did not however allow his affection to his wife to interfere with his duty to his hoped-for family. If the female, who never left the nest but to solace herself with meat and drink, appeared to devote too much time to that indulgence, he remanded her back by a little blow with his

¹ Nuttall's *American Ornithology*, vol. i. p. 546.

² *Hist. Nat. des Perroquets*.

³ *Cupressus disticha*.

⁴ *Cock of the rock* of Peru, which is also somewhat related, apparently, to the parrots. (Note by Mr Nuttall.)

⁵ Nuttall's *Manual of Ornithology*, i. 456.

⁶ *Platanus occidentalis*.

⁷ *Celtis occidentalis*.

⁸ *Xanthium strumarium*.

⁹ *Ambrosia*, species.

¹⁰ *Platanus occidentalis*.

¹¹ Audubon, *Orn. Biog.* i. p. 139.

Scansores. beak, which occasionally produced something approaching to a quarrel. At the termination of twenty-five days, there being no appearance of progeny, the eggs were purposely withdrawn and broken, and were found to contain young in different stages of development, but all dead. This result was attributed to stormy weather, which had prevailed during incubation. Fortunately a second laying, accompanied by the same circumstances as the first, commenced on the 14th of July, and after twenty-three days, counted rigorously, the young appeared from each egg in a succession corresponding to the order of laying. They were at first covered by a grayish down, and were cherished with the tenderest solicitude by the parents, who on the approach of any threatened danger defended them with the greatest courage. It was in truth a curious sight to see two creatures before so kind and tenderly affectionate to those around them, so grateful for their food, and so solicitous of human kindness, converted by the strength of this new passion into little tigers, and so intractable as to attend no longer to fair hands or gentle voices. This natural wildness showed itself also strongly in the young ones, who recognised alone their parents, and bit and scratched at all the world besides.

A few species have the tail square, with the central feathers prolonged, and these in *Ps. setarius*, Temm. *Pl. Col.* 15, are bare of barbs, except at the tip.

The great mass of *parrots* properly so called, belonging to the restricted genus *PSITTACUS*, have the bill rather strong, the face clothed with feathers, the head large, without crest, the body thick, and the tail rather short and square. Green is the prevailing colour of the plumage, and the species are native to various countries both of the old world and the new. One of the best known, and most remarkable for its easy docility, the distinctness of its articulation, and general loquacious powers, is the common gray parrot, *Ps. erythacus*, of which the tail is red, and the orbits white and naked. It is an African species, and one of the earliest and most frequently imported. It has been known to breed in Europe,—a French gentleman at Marmande having had a pair which produced young ones for five or six years successively. They made their nest in spring, in a cask filled with saw-dust, the number of eggs being four, of which one was always unproductive. According to Labat a similar instance had previously occurred at Paris. Our present square-tailed group is very numerous.

The lories (genus *LORIUS*, Vig.) have the bill rather attenuated, the upper mandible much arched, compressed, the lower lengthened, and nearly entire. The tongue is described as bristly and tubular. The tail is rather short, slightly graduated. Various shades of red form the prevailing colour of the plumage. The species inhabit the East Indies and the Asiatic islands. Example, *Ps. unicolor*, *garrulus*, &c.

Certain short-tailed species, of small size, which inhabit the tropical countries of both the new and old world, form the genus *PSITTACULUS* of Kuhl. Such are *Ps. passerinus*, *tui*, &c. They are erroneously called parrakeets by some of our English writers, a name which would confound them with the long-tailed species already alluded to, and more generally recognised under that title. The vast extent of the parrot tribe renders subdivision extremely desirable as a matter of convenience; but it must be confessed that a mere difference in size and colour is not of itself sufficient to authorize the separation of groups, or the formation of genera.

The genus *MICROGLOSSUS*, Vieil., is, however, better founded. The bill, especially the upper mandible, is very large and strong, the head ornamented by a crest of nar-

row feathers, and the face naked. The tongue is cylindrical, lengthened, and tubular, capable of being greatly protruded from the mouth, and ending in a kind of corneous gland, cloven at the tip. (See Plate CCCXCVII. figs. 5 and 6.) The legs are more naked than usual, and the tarsi, on which they occasionally rest while walking, very short and square. The tail is square or even. We are not acquainted with more than two species, both from eastern countries. The black or giant cockatoo (*Ps. gigas*), called by old Edwards "a parrot of the first magnitude," and *Ps. aterrimus* of Gmelin, are the birds alluded to. Their synonymy seems confused. They inhabit New Guinea and the isle of Waigiou; and Edwards's figure was taken from a living specimen in Ceylon, but whether indigenous or imported does not appear. Vaillant observes of one of the species (his *ara noir à trompe*), that in cold weather it covered the bare space on each side of its face by lowering over them the feathers of the crest.

The great New Holland species, called the Banksian cockatoo, discovered in the course of Captain Cook's first circumnavigation, forms, with others, the modern genus *Calyptrorhynchus*. (Plate CCCXCVII. fig. 2.) These large dark-coloured species are as yet but ill defined. They are said to live on roots; but Mr Bennet alludes to one which feeds on the larvæ of insects, as well as on the seeds of *Banksia*, *Hakea*, and even of *Xanthorrhœa*, or grass tree; and in the travels of that gentleman we find the following passage, which relates to a certain locality in New Holland. "Black and white cockatoos had lately become very numerous about this part of the country: the former appeared to have been attracted by some trees that had been felled when clearing a spot of land for cultivation,—as these birds visit the dead or fallen trees to procure the larvæ of insects that breed in them. I have seen, more than once, small trees lying prostrate, occasioned by the powerful bills of the large black cockatoos, who, observing on the trunk, externally, indications of a larva being within, have diligently laboured to extract it; and should the object of their search be situated (as often occurs) far in, before they reach it the trunk is so much cut through, that the slightest puff of wind lays it prostrate."¹

The white-plumaged cockatoos, with conspicuous crests, tinged in part with orange, red, or yellow, pertain to the genus *PLYCTOLOPHUS*, Vieil. (Plate CCCXCVII. fig. 3.) They inhabit New Holland and the eastern islands, and are remarkable for their great docility. They are said to prefer the vicinity of marshy places.

A beautiful small parrot, with longer legs than usual, and straighter claws, forms the genus *PEZOPORUS*, Illiger. It is green and yellow, spotted with black, the frontlet red, the tail long and graduated. The outer hind claw is very long. This singular bird, commonly called the ground parrot (*P. terrestris*, Shaw,—*P. formosus*, Latham), differs from its congeners in hardly ever perching upon trees. It remains upon the ground in sedgy plains, or runs among the long grass, almost after the manner of a rail. (Plate CCCXCVII. fig. 4.)

At the conclusion of the scansorial order Cuvier has placed two genera which have certainly but little in common with the preceding groups, and which some consider as allied to the gallinaceous order, while others have placed them in the coriostiral tribe of Passeres,—we mean *CORYTHAIX* and *MUSOPHAGA*. In both the bill is rather short, the upper mandible bulged or rounded, the feet have a short membrane between the toes, and although these are not placed exactly in pairs, yet the outer toe is versatile to a considerable degree. The nostrils are simply pierced in the corneous portion of the bill, the margins of which are dentated. In the plantain-eaters (genus *MUSOPHAGA*,

¹ Wanderings in New South Wales, &c. i. 182.

Rasores. Isert, Plate CCCXC VII. fig. 8) the base of the bill forms a raised, expanded disk upon the forehead. The violet plantain-eater (*M. violacea*) is a bird of great beauty, the general plumage being of a rich glossy violet black, the crown and primaries crimson, the bill yellow tipped with red, and a clear white stripe beneath the eye. It occurs in the province of Acra, in Guinea, and in other parts of Western Africa, and feeds on the fruit of the musa or plantain tree. The touracos (genus *CORYTHAIX*, Illiger, Plate CCCXC VII. fig. 7) want the expansion at the base of the bill, and have the head adorned by an elongated crest. Several beautiful species belong to this genus, such as the *Cuculus Persa* of Linn., a native of the Cape,—of a fine green colour, with a portion of the quill-feathers crimson. Vaillant informs us that there are great numbers of these birds in the country of the Kottinquoas,—that they are very difficult to shoot, as they perch only on the summits of the tallest trees, and rarely suffer any one to approach within gun-shot,—but that they are easily caught alive in snares baited with such fruits as are in season. He adds, that they are excellent eating. Another species of this genus, which it is delightful to look upon, is the Pauline touraco, *C. Paulina*, also a native of Southern Africa. M. Vieillot, who had occasion to examine one alive in Paris, informs us that its manners were mild and familiar, that it lived on succulent fruits, and was fond of sugar. Its habits were active, its voice sonorous, and apparently ventriloqual.

ORDER IV.—RASORES.¹

GALLINACEOUS OR RASORIAL BIRDS.

The species of this order, by far the most valuable to the human race of all the feathered tribes (how many, regardless of Ornithology, yet dwell with pleasure on a roasted turkey), are characterized by a rather short and convex bill. The upper mandible is somewhat curved, and furnished with a cere, sometimes naked, sometimes feathered. The head is generally small in proportion to the body. The nostrils are placed on each side of the bill, and usually in a fleshy protecting membrane. The tarsi are for the most part elongated. The toes are four in number, three of which are anterior, and united by a membrane more or less extended, at their bases; the fourth, posterior, is articulated higher than the others, and is in some cases very small, or even entirely wanting.

This order, as we have elsewhere noticed, contains several of the most ornamental, and a great majority of the most highly prized and useful species of the feathered race. While the peacock and golden pheasant stand unrivalled alike for elegance of form and beauty of plumage, the turkey and domestic fowl, the grouse quail and partridge, lay claim to more substantial though less sentimental regard, as conducing in no small degree to the social enjoyments of civilized life. Gallinaceous birds are generally distinguished by a bulky form, and a heavy and somewhat laborious flight. In fact, the sternum or breast-bone is so deeply notched on either side as to diminish the support afforded to the action of the pectoral muscles; and the power of the wings, and consequent duration and velocity of their movements, suffer a corresponding diminution.

With the exception of the alectors or curassees, few of the gallinaceous species build on trees (in which they differ remarkably from the preceding orders), though all delight in basking on the ground, and scraping in the dry and sultry soil, for which purpose they are provided with muscular limbs and feet. They live upon all sorts of grain

and seeds,—occasionally upon berries, or the buds of shrubs and trees,—and, the younger birds especially, show themselves sufficiently eager and expert in the capture of insect prey. The females lay a great number of eggs, in a rude and carelessly constructed nest; and the newly-produced offspring, unlike the callow nestlings of the other orders, though they remain for some time associated with their parents, run swiftly, and pick freely from their first exclusion. The males, particularly towards the breeding season, are quarrelsome and courageous,—indulging in frequent and sometimes fatal contention. They are often furnished with spurs. In the satyr pheasant both sexes are so armed, and the males are moreover provided with a couple of horns. In the polyplecton the tarsi of the male are doubly armed, there being two spurs on each leg.

In their general form and habits, the particular structure and functions of the digestive system, and the great benefits which they confer upon the human race, birds of this order have been observed to bear a considerable resemblance to the ruminating or herbivorous quadrupeds. Like these, their stomach is of a more complex character, consisting of a dilated membranous pouch or crop, and a muscular gizzard,—in the former of which their food is rendered moist and pulpy, in the latter it is bruised and broken, and otherwise prepared for the production of the life-sustaining chyle; whereas in accipitrine birds the crop is either inconspicuous or non-existent, and the stomach, if not membranous, at least has its muscular coating very thin. The intestine in gallinaceous birds is rather long and wide, of nearly uniform diameter, and provided with two enormous cæca. Their flesh, we need scarcely say, is very delicate, and highly esteemed as a pleasing and nutritious food. It varies considerably in colour,—that of the turkey and common poultry being white, of the moor grouse brownish red, while the breast of the black-cock presents two distinct layers of red and white, the one imposed upon the other. We allude at present to its *culinary* aspect.

Naturalists have erred in assigning the polygamous habit as a general characteristic of our present order. The instinct to pair, or habit of monogamy, is no doubt bestowed only on those species to which it is necessary for the sustentation of their young, and differs considerably in the nature and permanence of the attachment, according as the nest is placed above or upon the surface of the ground. All birds which build on trees, as was long ago observed by Lord Kames, are hatched blind, or extremely defective in the sense of sight, and almost without feathers,—thus requiring the sedulous care of both parents. But the generality even of gallinaceous birds, which breed upon the ground, do likewise pair, though the hatching of the eggs is entirely confided to the female, who completes her task by leading the young towards their proper food, which they are able to select for themselves, being active, completely formed, and well feathered, from their first exclusion. What is indeed more beautiful than the fond affection of these devoted creatures, teaching in the blindness of instinctive love, a lesson to proud but cold humanity? Who knoweth not (now divinely told) how the hen “doth gather her brood beneath her wings;” how she shelters them from the nipping blast, expanding her downy breast and feathery pinions, till she becomes a populous tabernacle, a living temple of maternal love, beset with small protruding bills, and bright but gentle eyes; how she will dare, with upraised ruffled plumes, the fiercest onset of the direst foe,—the callous school-boy with his threatening club, the snarling cur-dog with his ivory fangs, the insidious weasel, creeping serpent-like through tangled herbage, or the bolder bird of prey, “lord of the lion

¹ GALLINÆ, Linn.

Rasores. heart and eagle eye," descending swift and sure, like thunder-bolt from heaven! What are each or all of these in dread array, with death itself, to her at other times a fearful creature, but now pervaded by the deep intensity of mother love? Who knoweth not these things may have wandered far through wood and wilderness, up vast and lonely mountains, in moist and green savannahs, o'er dry and desert sands,—but he has never turned a kindly and considerate eye towards perhaps the too familiar features of some lowly farm-stead close by his early home. Yet to such thoughts the mind, in those that loved them once, not seldom turns. The hoary worn-out warrior, with "scars entrenched," and decked with emblems of the blood-stained field,—the smooth but hollow statesman, gorgeous on gala days in regal throngs,—the lawyer with insidious tongue, by which the worse is made the better reason,—the nabob "with visage discomposed," sallow as his gold (his heart as pure?),—the soft physician, with stilly foot and ever ready palm,—the merchant prince dreaming of "Tyre and Sidon," of freighted vessels, and "the injurious sea,"—think they not often of their boyish years, when one bright summer day seemed like a century of such delight as all their best planned schemes of proud ambition since then have yielded never? But in these fantastic thoughts forget we not our *gallinaceous* order?

The male, though somewhat less assiduous than the female, continues to manifest a certain degree of parental solicitude, by uttering the alarm note on the approach of birds of prey, or other dangerous foes. Black game and wood grouse, however, do not seem to pair at all, but in the genial spring a male assembles round him a certain number of devoted females, which afterwards deposit their eggs, and rear their young altogether independent of the male parent. These birds are therefore polygamous in the proper acceptance of the term. Indeed, even among herbivorous quadrupeds pairing is rare, because the female can suckle her young while she herself is feeding;—but the monogamous habit probably obtains among most carnivorous quadrupeds, and certainly among all carnivorous birds, because incubation leaves the female no sufficient time to hunt for food,¹ and because young birds cannot bear a long fast, and therefore require the assistance of both parents while unable to provide for themselves.

An extraordinary circumstance has been observed in the females of certain genera of this order, viz. an assumption of the male plumage after a certain period of life. We believe it to be a fact in the natural history of common poultry, that all hen-birds which either by accident or design have been allowed to attain the age of sixteen years complete, have been observed to assume the plumage of cocks! The same change has been seen to take place both in the female pheasant and the pea-hen, but at more indeterminate periods of life, and less in connection with an advanced age. Though these facts have not escaped the observation of the philosophical naturalist, yet the different circumstances attending their occurrence have not been detailed with sufficient frequency or fulness to admit of any satisfactory theory being offered in their explanation.² We shall conclude these general remarks by observing, that the gallinaceous order, with the exception of the pigeon tribe, and the genus *Opisthocomus* (*Thaozin*, Buffon), which certainly offer some very anomalous characters, is naturally and consistently composed. We shall now proceed to a brief notice of the principal genera.

The birds known by the general name of *Alectors* are species of large size from South America, somewhat allied to turkeys. Their tails are broad and rounded, and composed of large stiff feathers. They inhabit woods, living on fruits and buds, perching and building their nests on

trees, and dwelling gregariously in love and amity. They are known under the by no means euphonious names of *hocco*s and *jacous* (words which we shall not pronounce except when necessary), and are arranged as follows by Baron Cuvier. The *hocco*s properly so called, which are also known as *curassoes* (genus *CRAX*, Linn., Plate CCCXCIII. fig. 1), have the bill strong, and its base surrounded by a skin sometimes of lively colour, and containing the nostrils. The head is ornamented by a tuft of long, narrow, recurved feathers. The most common kind is the *Crax alector*, or crested curasso, which was at one time almost completely acclimated in Holland, where they were as prolific as common poultry. It is so frequent in the woods of Guiana as to form, according to M. Sonnini, the surest resource of every hungry traveller whose stock of provisions may be found exhausted, and who has therefore become dependent on his gun. They are gregarious, and even when a considerable number have been shot, the rest will remain quietly perched, as if unconscious of the surrounding slaughter. Several other species are described in systematic works. *C. globicera* is distinguished by a large rounded tubercle on the base of the upper mandible.

In the genus *OURAX*, Cuv., the bill is shorter and thicker, with its basal membrane, as well as the greater portion of the head, covered with short, velvety feathers. (Plate CCCXCIII. fig. 2.) Here is placed the *Ourax pauxi* (*Crax pauxi*, Linn.), or galeated curasso, a large turkey-like bird, with plumage of a shining black with green reflections, the abdomen and under tail-coverts white. At the base of the beak is a great oval tubercle, of a pale blue colour, and as hard as stone. The structure or position of the windpipe is peculiar. "Sa trachée," says Cuvier, "descend dehors, le long du côté droit jusqu'en arrière du sternum, se recourbe vers le côté gauche, et revient en avant pour rentrer dans la poitrine par la fourchette. Tous ces anneaux sont comprimés." This species is a native of Mexico, where it lives gregariously, perching on trees, but building usually on the ground, and leading about its young after the manner of the pheasant and common hen. It is easily domesticated.

The guans or yacous, genus *PENELOPE* of Merrem, have the bill more slender than the preceding, with a bare space around the eye, and on the lower part of the throat,—the latter generally capable of inflation. The individuals of the same species seem to vary considerably, so that many doubtful kinds have been described by naturalists. The guan, commonly so called (*Pen. cristata*, Gmelin), is the largest of the genus, measuring about thirty inches in total length. The whole upper surface of the body is of a dusky black or bronze colour, glossed with green and olive. The feathers on the back of the head form a thick erectile crest. The fore part of the neck and breast are spotted with white, each feather being surrounded by a white border. The naked part of the throat is bright scarlet, with a depending fold of the same colour. The manners of this bird resemble those of the curassoes. They search for food along the ground, but perch and build upon the tops of trees. They are less gregarious, generally keeping together in pairs, and remarkable, it is said, for the strictest constancy, and their strong attachment to each other,—being thus deserving of the name they bear, that of the devoted consort of Ulysses.

The genus *ORTILDA* of Merrem scarcely differs from the preceding, except in having a much smaller portion bare around the eye and throat. We are acquainted with only a single species, the *Phasianus motmot* of Gmelin (*Phas. parragua*, Lath.). Its voice is very strong, and the windpipe descends beneath the skin towards the abdomen, and then remounts into the chest. The plumage is of a bronzed

See Kames's *Sketches*.

² Wilson's *Illustrations of Zoology*, vol. i. Order GALLINÆ.

Rasores. brown above, and ashy-white below, the crest red. It inhabits Brazil, Paraguay, and Guiana. Two other species are described by M. Lesson, *Ort. Goudotii* and *squamata*,—the former inhabits the mountains of Santa Fé de Bogota, the latter is native to Brazil.¹

The genus *OPISTHOCOMUS* of Hoffmannsegg (*Sasa* of Vieil.) is associated in our present system with the preceding alectors. The only known species (*Phasianus cristatus*, Lath.) has the bill short and thick, the nostrils pierced in its corneous portion, without the usual surrounding membrane. The head bears a crest of long, slender, decomposed feathers, and the toes (in which character it also differs from all the genuine gallinaceous kind) have no connecting membrane at the base. The bird occurs in Guiana, where it is usually seen perched in places subject to inundation. It lives chiefly on the leaves and seeds of a species of arum. Its flesh has a strong smell of castoreum, and is used only as a bait for fishes. "Il forme," says Baron Cuvier, "un genre très distinct des autres gallinacées, et qui pourra devenir le type d'une famille particulière quand on connaîtra son anatomie."² Its true situation in the natural system seems at present quite uncertain, but, from its great diversity in different works, must assuredly in some be most erroneous.

In the genus *PAVO* of Linn., the bill, of moderate size, is bare at the base, the nostrils lateral, sub-basal, open. The head is crested, the cheeks are naked, or nearly so. The tarsi are rather long, and armed with a conical spur. The upper coverts of the tail are of singular length and magnificence. The tail itself is erectile and wedge-shaped. The wings are rather short. This genus, as now restricted, contains only two species. The common peacock (*Pavo cristatus*, Linn.), so much admired for the surpassing splendour of its plumage, and now so familiarly known as a domestic bird, has probably been reduced to a state of dependence, if not of servitude, for some thousand years. The earliest notice we possess of it is contained in the second book of Chronicles. "For the king's ships went to Tarshish with the servants of HIRAM: every three years once came the ships of Tarshish, bringing gold, and silver, ivory, and apes, and peacocks." The introduction of this beautiful bird to the western countries of Europe has never been clearly traced,—but every step of its progress has no doubt been owing rather to the agency of man than the instinct of nature. Its inborn tendency would clearly have been to return to whence it came,—to seek again the perpetual sunshine, and ever-verdant forests of Asia, the banks "of Ganges or Hydaspes, Indian streams." It appears to have been unknown even in Greece during the early manhood of Alexander the Great, by whom it was first observed with no less wonder than delight in the progress of his southern expedition, and then transmitted to his native country. There, however, it must have multiplied speedily, as Aristotle, who died in a year or two after "the great Emathian conqueror," mentions the peacock as a well-known bird. It is now distributed among most civilized nations, beautifying with lustrous train our verdant lawns, and arching its proud emblazoned neck among the "ancestral trees" of many lordly dwellings. The cry of the peacock, unless when mellowed by distance, is harsh and unmusical, but extends far and wide. Indeed the notes of all birds, whether musically toned or inharmonious, are very clear and forcible. The voice of a blackbird may be heard as far as that of a man,—the clanging cry of the

stork has been calculated to fill a circumference of nearly half a league, and the harsh scream of the peacock extends as far as that of an elephant.³ Mr Waterton observes, that the singular metallic note of the campanero or bell-bird of America is audible from a distance of three miles.

The only other species of this genus (as now restricted) is the Japan or Javanese peacock (*P. japonensis*, Briss.,—*P. Javanicus*, Horsfield), of which we have elsewhere figured both the adult male and young, under the name of Aldrovandine peacock, from the specimens in the Edinburgh Museum.⁴ It occurs in Japan, Java, and other eastern and southern regions of Asia. The particular markings and general distribution of the colours in the train scarcely differ from those of the better-known species; but the Aldrovandine bird may be distinguished at first sight from the common kind, by a difference in the form, colour, and consistence of the cervical feathers; by the shape and structure of the occipital crest, of which the plumes are lance-shaped, or broadly linear, and barbed throughout their entire length, instead of being merely tufted at the extremities; by the dissimilar plumage of the wing-coverts, and the number of feathers in the tail, which in the former consists of twenty, in the latter of only eighteen.

The genus *POLYPLECTRON*, Temm., contains a few species formerly classed with the preceding, but of smaller size, and distinguished by a pair of spurs on each tarsus. Such is the beautiful Thibet peacock (*Pol. Thibetanus*), the peacock-pheasant of Edwards, of which a great proportion of the plumage is ornamented by large and very brilliant spots of greenish blue, changing with the varying light to gold and purple, and surrounded by circles of black and yellowish white. The male is about the size of the golden pheasant. The plumage of the female is less brilliant, and her tail shorter. The colour in the young of both sexes is earthy gray, with large spots and small lines of brown. This species is of easy domestication, and not remarkable for shyness even in a state of nature. It is native to the mountains of Thibet, and is said also to occur in China. At least it is frequent in the aviaries of that leaf-soaking people.

The genus *LOPHOPHORUS*, Temm., distinguished by its tufted hanging crest, and strongly bent and broadly margined bill, contains that splendid bird the Impeyan pheasant (*Loph. refulgens*), of which the colours of the plumage are so exceedingly brilliant from their metallic lustre, and so variable according to the direction of the light or the position of the spectator, that they cannot be expressed by words, and even the skill of the most accomplished painter would in vain attempt to equal the bright original. Purple, green, and gold, are the prevailing hues. The female, however, is almost entirely destitute of metallic splendour. This bird inhabits the mountains in the northern parts of Hindustan. Lady Impey endeavoured to transport it alive to England, but it died on the passage. It is known to the natives by the name of *monaul*, which signifies the bird of gold.

The genus *MELEAGRIS*, Linn., distinguished by its bare and wattled head and neck, and broad erectile tail, contains the valuable but unromantic turkey, *M. gallo-pavo*, Linn., a heavy and ungraceful bird, as it exists in the poultry-yards of Britain, but of a richer plumage and more powerful wing in its native wooded wilderness. "The wild turkey," observes Mr Nuttall, "once prevalent throughout

¹ *Dictionnaire des Sciences Nat.* t. lix. p. 195.

² We have few opportunities (fortunately) afforded us in this country of judging of the strength of voice in wild beasts. Our own experience extends only to the following homely fact, which, however, it may be worth while to mention. During the residence in Edinburgh of Mr Wombwell's and other travelling menageries, we have endeavoured to test the extension of the lion's voice from different quarters. We have often heard it very distinctly on a still evening, about feeding time, from the top of Craighleith quarry, distant from the menagerie (on the Mound, Princes Street) about two miles and a half.

³ *Illustrations of Zoology*, vol. i. pl. 14, 15.

⁴ *Règne Animal*, t. i. p. 473, note.

Rasores. the whole continent of North America, from Mexico and the Antilles to the forests of Lower Canada, is now, by the progress and density of population, chiefly confined to the thickly wooded and uncultivated tracts of the western states, being particularly abundant in the unsettled parts of Ohio, Kentucky, Illinois, Indiana, and throughout the vast forests of the great valleys of the Mississippi and Missouri. On the banks of the latter river, however, where the woods disappear beyond the confluence of the Platte, the turkey no longer appears, and the feathers of the wings, for the purpose of pluming arrows, form an article of small commerce between the other natives and their western countrymen. For a thousand miles up the Arkansas and Red River, in the wooded alluvial lands, they are not uncommon. They are likewise met with in small numbers in Tennessee, Alabama, and West Florida. From the Atlantic states generally they are now nearly extirpated. The wild turkey is neither gregarious nor migratory, but from the necessity of wandering after food; it is otherwise resident throughout the whole of the vast region it inhabits, including the greatest diversity of climate; and it is prolific in proportion to its natural resources, so that while in the United States and Canada it only breeds once in the year, in Jamaica and the other West India islands it is said to raise two or three broods in the same period. In quest of mast, they therefore spread themselves through the country, and insensibly assemble in considerable numbers to the district where their food abounds. These movements are observed to take place in October (the turkey moon of the aborigines). The males, or *gobblers* as they are often called, from their note, are now seen apart from the other sex, in companies varying from ten to a hundred. The females move singly, or accompanied by their almost independent brood, who all at first shun assiduously the persecuting society of the selfish male. Yet after a while, when their food proves abundant, separate mixed flocks of all ages and sexes often promiscuously join in the bounteous repast. Their migration, very unlike that of the rapid pigeons, is made almost entirely on foot, until their progress is perhaps arrested by a river. Their speed, however, is very considerable, and when surprised, they more commonly trust to their legs than their wings, running nearly with the velocity of a hound. On meeting with an impediment of this kind, after considerable delay, they ascend to the tops of the tall trees, and, at the cluck of the leader, they launch into the air for the opposite shore. The transit is a matter of little difficulty, though considerable labour, for the older birds; but the younger and less robust sometimes fall short of the bank, and are either drowned or attain the land by swimming. After crossing, it is remarked that they often become an easy prey to the hunter, as they seem bewildered by the new country in which they have arrived, or more probably are fatigued by the novelty and extent of their excursion. After long journeys and privations, particularly in frosty weather, or while the ground is covered with snow, they are sometimes reduced to the necessity of making their appearance near farm-houses, where they now and then even associate with the poultry, and enter the stables and cribs after grain. In this desultory and foraging manner they spend the autumn and winter.

"According to the latitude, and the advancement of the season, though always very early in the spring, they begin to be actuated by the instinct of propagation. The males commence their gobbling, and court the society of their retiring mates. The sexes roost apart, but in the same vicinity, and at the yelp of the female the gobbling becomes reiterated and extravagant. If heard from the ground, a general rush ensues to the spot, and whether the hen appears or not, the males, thus accidentally brought together, spread out their train, quiver and depress their

rigid wings, and strutting and puffing with a pompous gait, often make battle, and directing their blows at the head, occasionally destroy each other in a fit of jealousy. As with our domestic fowls, several hens usually follow a favourite cock, roosting in his immediate neighbourhood, until they begin to lay, when they withdraw from his resort to save their eggs, which he would destroy if discovered.

"The females are therefore seen in his company only for a few hours in the day. Soon after this period, however, the male loses his ardour, and the advances of affection now become reversed, the hen seeking out the society of her reluctant mate. In moonlight nights the gobbling of the male is heard, at intervals of a few minutes, for hours together, and affords often a gratifying means of their discovery to the wakeful hunter. After this period the males become lean and emaciated, so as to be even unable to fly, and seek to hide themselves from their mates in the closest thickets, where they are seldom seen. They now also probably undergo their moult, and are so dry, lean, and lousy, until the ripening of the mast and berries, as to be almost wholly indigestible, and destitute of nutriment as food. So constant is this impoverished state, that the Indians have a proverb, 'As lean as a turkey in summer.'

"About the middle of April, in Kentucky, the hens begin to provide for the reception of their eggs, and secure their prospects of incubation. The nest, merely a slight hollow scratched in the ground, and lined with withered leaves, is made by the side of a fallen log, or beneath the shelter of a thicket, in a dry place. The eggs, from ten to fifteen, are whitish, covered with red dots. While laying, the female, like the domestic bird, always approaches the nest with great caution, varying the course at almost every visit, and often concealing her eggs entirely by covering them with leaves. Trusting to the similarity of her homely garb with the withered foliage around her, the hen, as with several other birds, on being carefully approached, sits close without moving. She seldom indeed abandons her nest, and her attachment increases with the growing life of her charge. The domestic bird has been known not unfrequently to sit steadfastly on her eggs until she died of hunger. As soon as the young have emerged from the shell, and begun to run about, the parent, by her cluck, calls them around her, and watches with redoubled suspicion the approach of their enemies, which she can perceive at an almost inconceivable distance. To avoid moisture, which might prove fatal to them, they now keep on the higher sheltered knolls; and in about a fortnight, instead of roosting on the ground, they begin to fly at night to some wide and low branch, where they still continue to nestle under the extended wings of their protecting parent. At length they resort during the day to more open tracts, or prairies, in quest of berries of various kinds, as well as grasshoppers and other insects. The old birds are very partial to pecan-nuts, winter grapes, and other kinds of fruits. They also eat buds, herbs, grain, and large insects; but their most general and important fare is acorns, after which they make extensive migrations. By the month of August the young are nearly independent of their parent, and become enabled to attain a safe roost in the higher branches of the trees. The young cocks now show the tuft of hair upon the breast, and begin to strut and gobble, and the young hens already pur and leap. One of the most crafty enemies which the wild turkey has to encounter is the lynx or wild cat, who frequently seizes his prey by advancing round, and waiting its approach in ambush. Like most other gallinaceous birds, they are fond of wallowing on the ground, and dusting themselves.

"When approached by moonlight, they are readily shot from their roosting-tree, one after another, without any

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Rasores. apprehension of their danger, though they would dodge or fly instantly at the sight of the owl. The gobblers, during the season of their amorous excitement, have been known even to strut over their dead companions while on the ground, instead of seeking their own safety by flight. In the spring, the male turkeys are called by a whistle made of the second joint bone of the wing of the bird, which produces a sound somewhat similar to the voice of the female; and on coming up to this call they are consequently shot. They are likewise commonly caught in quadrangular pens made of logs crossing each other, from which is cut a slanting covered passage sufficient to allow the entrance of the turkey. Corn is then scattered in a train to this cage for some distance, as well as within; and the neighbouring birds, in the surrounding woods, having discovered the grain, call on each other by a clucking, and entering one at a time, they become secured in the pen, as, for the purpose of escape, they constantly direct their view upwards, instead of stooping to go out by the path by which they had entered. The male wild turkey weighs commonly from fifteen to eighteen pounds, is not unfrequently as much as twenty-five, and sometimes, according to Audubon, even thirty-six. The hen commonly weighs about nine pounds; and the usual price for a turkey from the Indians is twenty-five cents.¹

The only other species of turkey is a very rare and beautiful bird (*M. ocellata*, Cuv.), of which, we believe, only a single specimen is yet known. It was captured by the crew of a vessel who were cutting wood in the Bay of Honduras, and was brought alive to the Thames, for presentation to Sir Henry Halford, but met with an accident which caused its death. It afterwards became the property of Mr Bullock; and on the dispersion of his collection, was purchased by the French government for the Paris Museum. It is nearly equal in size to the common turkey. The tail is less ample, but its colours are more varied and beautiful, almost rivalling those of the peacock in its little mirrors of sapphire, surrounded by circles of gold and ruby.²

The species known to us by the name of Guinea fowls, form the genus *NUMIDA*, Linn. The head is bare, the top in some crested, and the throat wattled. They are all either from Africa or Madagascar.

The great genus *PHASIANUS*, Linn., including our cocks and pheasants, has the cheeks more or less bare of feathers, usually covered by a scarlet skin, and the tail-feathers so placed as to slope downwards, roof-like, from either side. The group was soon found to be too extensive and varied in its component parts to accord with the preciser views of modern times, and several subdivisions have been in consequence effected.

The restricted genus *GALLUS*, for example (Plate CCCXCVIII. figs. 3 and 3 a), of which the head is generally surmounted by a fleshy vertical crest, the base of the lower mandible furnished with two flattened wattles, and the tail-feathers, fourteen in number, rising in two almost upright planes, with ample coverts in the male sex, contains, among other remarkable species, our domestic cock and hen (*Gallus domesticus*—*Phasianus gallus*, Linn.). The general attributes or special qualities of this brave, vigilant, and invaluable species, need not be here recorded; and indeed a volume would scarcely suffice to describe its numerous variations, from the pure undaunted blood of Derby, fearless of death, to the crested dung-hill breed, almost equally pugnacious, and by no means cowardly, yet apt to turn tail on the sudden touch of unexpected steel.

In our present paragraph we avail ourselves in part of a recent brief compendium. The cocks with ample crests,

Rasores. and five toes,—the rumpless cock, and those of many-mingled colours,—appear to have arisen chiefly from the various and prolonged circumstances attending domestication, and the intentional crossing of the breeds. The most picturesque are those with superabundant crests, and full auricular plumes. The crest is composed of narrow, hacked feathers, which grow erect from the head, but fall down in graceful curves, sometimes of such length as to shadow or overhang the eyes. In some districts this breed is much cultivated, being esteemed in proportion as the colours of the body and crest can be made to form the most conspicuous contrast, the body black, the crest white, and *vice versa*. Other admired fancy breeds are the Dutch pencilled fowl, which are pure white, with black spots; the Siberian fowl, with long tufts of hanging feathers springing from the lower jaw; and the Barbary fowl, of a pale dun colour, with the feathers of the neck extremely ample, and spotted with black. But a more singular anomaly is exhibited by those with five toes, commonly called *dorkings*, from being bred in most abundance in the neighbourhood of Dorking, Surrey. This race is easily continued, and is much esteemed for the table, being white and large. Dr Latham records one which weighed nearly fourteen pounds. A still more remarkable race is that without a tail, the rumpless or Persian cock, as it is sometimes called, which actually wants a portion of the caudal vertebræ. These are usually regarded as mere varieties, for the most part, probably, of accidental origin. There are, however, three races of cocks, of a very marked character, although their claim to actual specific distinction cannot be yet made out. The first is *Gallus morio*, of which the periosteum of the bones is black, and the comb, wattles, and skin, of a dull purple. It has received the name of negro or blackamoor cock, but is scarcely ever seen in the poultry-yards of this country. The other two races are more frequent, and are known as the silky cock (*G. lanatus*), and the Friesland cock (*G. crispus*). M. Temminck is inclined to regard the former as a distinct species. It occurs in China and Japan, where it is sold as a rarity to Europeans. In this country it crosses easily with the white domestic breed, and a mixed race is produced with the feathers still silky, but less disunited. It is singular that the skin and periosteum of this kind are of the same sable hue with those of *G. morio*, although the flesh is remarkable for its whiteness. The size is rather small, the plumage of the purest white, the comb and wattles purple. The Friesland cock evidently belongs to the opposition, having all the feathers turned the wrong way, or standing nearly at right angles with the body. The general colour of the plumage of this kind is also white, but it varies like that of other captive races. It occurs in the domesticated state in Java and Sumatra; but M. Temminck thinks it is also a distinct species, peculiar in the wild state to some unexplored quarter of the Indian islands.³ We doubt that nature, in her first intent, should ever have produced such an oddity.

Many fanciful and superstitious feelings are still maintained regarding the domestic cock, and his nocturnal crowing; and even his more familiar morning salutation is supposed to dispel all spirits, "whether in sea or fire, in earth or air."

Some say that ever 'gainst that season comes
Wherein our Saviour's birth is celebrate,
The bird of dawning singeth all night long;
And then, they say, no spirit walks abroad;
The nights are wholesome; then no planets strike;
No fairy takes, nor witch hath power to charm;
So hallowed and so gracious is the time.

¹ *Manual*, vol. i. p. 640.

² *Mém. du Muséum*, vi. pl. 1; and *Pl. Col.* 112.

³ *Naturalist's Library*, vol. iii. p. 173.

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Of the numerous benefits which the goodness of God has enabled man to derive from the wide circle of the feathered race, there is probably none which surpasses, either in extent or utility, the domestication of these most familiar birds. Of so long standing, however, has been the subservience of the race to man, that no authentic traditional traces now remain of its original introduction to any of the more ancient kingdoms of the earth,—its existence under human guardianship seeming indeed coeval with the most antique records. It may therefore be regarded as one of those particular and providential gifts, which, like the faithful and accommodating dog, was at an early period of the world added to the fortunes of the first families of the human race, and has since followed man in his wonderful and far-spread migrations through every clime and country. For some thousand years the observers of nature were ignorant of any wild species which, even in a remote degree, resembled any variety of the domestic breed,—and from the era of Herodotus to that of Sonnerat, the domestic cock and hen might have been regarded as birds, the living analogues of which were no longer known to exist in a natural and unsubdued condition.

In consequence of the remote obscurity in which the subject is thus involved, few points in natural history have occasioned more inconclusive speculation, or are even now more difficult to solve with certainty, than the source from which we have primarily derived our different races of domestic poultry. That they came originally from Persia, has been inferred from the circumstance of Aristophanes calling the cock "the Persian bird." Such an origin, however, is improbable, when we consider that the researches of modern travellers, and indeed of all who have visited that country since the revival of learning, have failed to discover there any species of wild poultry,—no gallinaceous bird being found in Persia more nearly allied to the genus *Gallus*, than a species of *Lophophorus*. If, however, it is merely meant that the Greeks, during the intercourse, hostile or otherwise, which existed between them and the Persian nation, may have obtained a breed previously domesticated, the idea is less objectionable; for it is known that in a domestic state poultry have existed in Persia from a very remote antiquity.

It appears from an ingenious dissertation by the late Dr Scot of Corstorphine, to have been the opinion of that learned Hebraist, that poultry were unknown to the Jews, or at least that they are not distinctly alluded to in the Old Testament. It cannot, however, admit of a doubt, that they were well known over many parts both of Europe and Asia for several hundred years before the Christian era. When Themistocles took the field to combat the Persians, he alluded, while haranguing his troops, to the invincible courage of the feathered biped. "Observe with what intrepid valour he fights, inspired by no other motive than the love of victory; whereas you have to contend for your religion and your liberty, for your wives and children, for the tombs of your ancestors;" and it was on this occasion that the Athenians achieved one of the most memorable victories recorded in history. According to Ælian, it was in commemoration of this signal event, and of the ornithological image by which the courage of the soldiery had been excited and sustained, that the Athenians instituted those annual games of which cock-fighting formed so conspicuous a feature. Now Themistocles died in the sixty-fifth year of his age, and about the 449th year preceding the Christian era, and must consequently have been contemporary with Nehemiah the prophet; and as the Old Testament history does not conclude till about twenty years after the death of Themistocles, it may be

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inferred, that if the later of the sacred historians do not mention poultry, it must be from some other cause than ignorance of their existence,—seeing that as the early Greek nations had received them prior to that period, either from Persia or the more south-eastern countries of Asia, they could scarcely have remained unknown in the intermediate regions inhabited by the Jews. For these and other reasons, which it would here be tedious to detail, we do not agree with Dr Scot.

In regard to the natural origin of these domestic birds, the first approximation to the truth (and we deem it but an approximation) resulted from the discovery by Sonnerat of a species of wild poultry native to the mountains of the Ghauts, in India. This is the *Gallus Sonneratii* of systematic naturalists, better known to British residents by the now familiar name of *jungle-cock*. Our knowledge of gallinaceous birds, however, has so greatly increased during recent years, and so many additional species have been discovered, that we are able to proceed upon much more certain ground than were the naturalists of the last century. The jungle-cock is not only no longer the only claimant to the long dormant title which, under whatever name of honour, may be due to the species so greatly beneficial to the human race, but other aspirants have come forward with such better-founded claims, that his may fairly be regarded as altogether set aside. In fact, several important characters of the jungle-cock have never been traced in any of the domestic varieties, and many of these latter present features which, if not incompatible with, at least bear no resemblance to any attributes of the supposed original. We may here observe, that the natural form and structure of any portion of the animal organization are much less easily effaced or altered than the more superficial character of colour; and hence, if a particular species of bird be naturally distinguished by a peculiar consistence as well as colour of plumage, the influence of those causes which produce variation less frequently affect the former than the latter. Reasoning therefore *a priori*, it would be more natural to expect that if the jungle-cock were the parent of our domestic breeds, such breeds, however they might vary in the colouring of their plumage, would at least at times exhibit those marked and peculiar characters of form and structure by which the feathers of the supposed original are distinguished. This, however, is not the case. Amid the infinite varieties which occur among our domestic poultry, the plumage of none is found characterized by those horny laminæ, or expansions of the shaft, which form so marked a feature in the plumage of the jungle-cock, and which assuredly would have either continued a permanent feature, or been occasionally manifested in one or other of our domestic breeds, had these been derived from the species in question. We may mention another circumstance on which we believe we were ourselves the first to insist.¹ The native tribes of Indians inhabiting the districts where the jungle-cock abounds rear a breed of poultry which differs as much from the supposed original as our own, and which never intermingles with the forest brood.

According to M. Temminck (and in this we quite agree with that industrious and observant naturalist), the species to which our domestic races are most nearly allied, are the *Jago cock* of Sumatra (*Gallus giganteus*), a wild species of great size, and the *Bankiva cock* of Java, another primitive species, which occurs in the forests of the last-named island (see Plate CCCXCVIII. figs. 3 and 3a. There are several circumstances which render the claims of these two birds much stronger than those of the jungle-cock. 1st, Their females bear a strong resemblance to our domestic hens; 2dly, the common village cock, in its most ordi-

¹ See our Essay "On the Origin of Domestic Poultry," in the *Wernerian Memoirs*, vol. vi. p. 402.

Rasores. nary condition, is intermediate, in respect to size, between these two species; 3dly, the nature of the plumage, which in its form, consistence, and distribution, is absolutely the same as in the common cock, greatly strengthens the supposition; 4thly, it is in these species alone that we find the females, as well as males, provided with a fleshy crest and small wattles,—characters which likewise distinguish both sexes of our common poultry, although they are for the most part but slightly developed in the females. Now the female jungle-cock possesses neither comb nor wattles.

It may be stated as a curious though well-known fact, that when Captain Cook first visited the South Sea Islands, he found them well stocked with domestic poultry; and the more recent as well as more ample narratives of the missionaries have confirmed the statements of the great navigator regarding the practice of cock-fighting in Otaheite, and other islands of Polynesia. Mr Ellis describes the *Faa-ti-to-raa-moa*, or literally the causing fighting among fowls, as the most ancient game of the Tahitians; and he informs us, that according to the tradition of the natives, poultry have existed in the islands as long as people,—that they either came with the first colonists, or were produced by Taaroa contemporaneously with men. Long before the first foreign vessel was seen off their shores, they were in the practice of training and fighting cocks. However, they never trimmed, as we do, their flowing plumes, but were proud to see the beautiful and gorgeous combatants with ample natural wings, full-feathered necks, and lengthened tails. We may observe, that the breed of these islands do not appear to have been what in this country we would denominate *game*; for Mr Ellis (in his *Polynesian Researches*) incidentally mentions, that as soon as one bird avoided another, he was considered as *vi*, or beaten, and victory was declared in favour of his opponent. It is indeed a singular circumstance that this barbarous practice should have pervaded so many unconnected nations, both savage and civilized. It has entirely ceased among the inhabitants of the Friendly and Society Islands since the establishment of Christianity, although still pursued by the practical heathen of other and more ancient Christian lands. We ourselves, to our shame be it spoken, once fought a main of cocks with an English clergyman, who has since held a high and conspicuous station in the church. We believe, indeed, that he is now a bishop,—haply forgetful of us and of our famous *Faa-ti-to-raa-moa*.

In the genus *PHASIANUS* properly so called, the sides of the head around the eyes are covered for a space by a naked warty skin. The tail is very long and slender, each feather laterally inclined or roof-shaped, and the central pair usually much prolonged. The common pheasant of our coverts (*Ph. colchicus*) is the most familiar example. This bird is now well known in most of the temperate parts of Europe, though originally introduced from the banks of the Phasis (now the Rioni), a river of Chalcis in Asia Minor. Need we describe his glowing bright attire?

Splendid his form, his eyes of flaming gold
Two fiery rings of living scarlet hold;
His arching neck a varying beauty shows,
Now rich with azure, now with emerald glows.
His swelling breast with glossy purple shines,
Chesnut his back, and waved with ebon lines;
To his broad wings gay hues their radiance lend,
His mail-clad legs two knightly spurs defend.

The variety called the ring-pheasant (*Ph. torquatus*), characterized by a more or less completed circle of white around the lower portion of the neck, is by some regarded as a distinct species. The gold and silver pheasants of our aviaries (*Ph. pictus* and *nycthemerus*), and several other still more magnificent birds, on the beauty of which we regret we cannot here dilate, pertain to our present genus.

One of the most singularly superb of all the gallinaceous order, we mean the argus pheasant, now forms a separate genus under the name of *ARGUS*. Of this rare and remarkable bird (*A. giganteus*, Temm.) China and the adjoining provinces of Tartary have been assigned as the native country by various writers. This, however, requires confirmation, as all the specimens of which the origin is accurately known have been brought from the great eastern islands and peninsula of Malacca. There is a passage in Marco Polo's *Travels*, which may perhaps be construed as relating to the bird in question. In his description of the kingdom of Erginal (a district of Tangout, in the north-west of the empire), he observes, "pheasants are found in it that are twice the size of ours, but something smaller than the peacock. The tail-feathers are eight or ten palms in length." "This," observes Mr Marsden, the learned editor of the English edition, "is probably the Argus pheasant, which although a native of Sumatra (where I have frequently seen it alive), is said to be also found in the northern part of China."¹ Though of late years well known in the *Basses-cours* of Batavia (from which M. Temminck received a splendid series), we are not aware that the Argus has been ever imported alive into Europe. It would certainly prove a more magnificent addition than any which has been made to our aviaries in modern times. The great apparent size of this bird arises chiefly from the peculiar formation of the wings, of which the secondaries are three times the length of the primaries, being nearly three feet long. In consequence of the unwieldy extent of that portion of the wing which is not under the immediate influence of muscular action, this magnificent bird is alleged to be almost destitute of the power of flight. Its progress, however, when running on the ground, is greatly accelerated,—the expanded secondaries, according to M. Temminck, acting as powerful and capacious sails, and furnishing a very fleet and effectual mode of transportation. The body, when stripped of the feathers, scarcely exceeds that of a barn-door fowl, but in its "high and plummy state" it measures in total length about five feet three inches,—the tail-feathers being themselves nearly four feet long. The female is, as usual, less adorned. Her secondaries want the peculiar breadth and extension, as well as the beautiful eye-like markings which adorn the male. In consequence, however, of this homely appearance, she is less frequently sought for in her native forests, and is thus (in collections) by far the rarer of the two. M. Temminck, for example, thought himself fortunate in finding a brace of females among thirty males.

In the genus *EUPLOCOMUS*, Temm., the head is crested, the tail much broader than in the true pheasants, and sometimes forked. The beautiful Macartney cock, or fire-backed pheasant (*Eu. ignitus*), is the most characteristic, if not the sole example. It was met with by Sir George Staunton in a menagerie at Batavia, and is believed to be a native of Sumatra.²

The horned pheasant of Edwards and Latham has been made by Cuvier to constitute the genus *TRAGOPAN*. The head, though crested, is elsewhere almost naked; a little slender horn projects backward from behind each eye, and a loose and pendent skin, inflatable at pleasure, hangs from the base of the lower mandible (see Plate CCCXCVIII. fig. 4). The group now consists of about four species, all remarkable for their richly varied and beautifully spotted plumage. They are bulkier birds than pheasants, with rounded tails of ordinary length. The females of such as are known are brindled with brown and black. We have yet learned nothing of the habits or natural economy of the Tragopans, although their external aspect has been rendered familiar in elegant representations by Mr Gould.³ The

¹ *Travels*, pp. 225-9.

² *Embassy to China*, pl. xiii.

³ *Century of Birds from the Himalaya Mountains*.

Rasores: first discovered species (*T. satyrus*), though usually brought from Nepal, has been ascertained also to inhabit Thibet; and Chinese specimens from the mountain province of Yunnan were seen by Mr Bennet in Mr Beale's aviary at Macao.¹

The genus *CRYPTONYX*, Temm., has a bare space around the eye, the tail of medium size and flat, and the tarsi without spurs; but the most peculiar character consists in the hind toe being destitute of claw. The best-known species is *C. coronatus*, or *rouloul* of Malacca (see Plate CCCXCVIII. fig. 5). The female is described by Latham under the title of *Tetrao viridis*. It inhabits deep forests, is wild and cunning in a state of nature, and in confinement impatient of restraint.

The great genus *TETRAO* of Linn. has also been greatly subdivided in recent times. All the species seem to agree in having a bare band above the eye.

The restricted genus *TETRAO* has the legs covered with feathers, and without spurs. In some the toes are naked, and the tail either forked or rounded. Such is the great wood grouse or capercaillie (*T. urogallus*), the largest and finest example of the gallinaceous order indigenous to Europe. In Britain it has been long extinct in the wild state (although of late several times imported with a view to re-establish the breed), and now occurs chiefly in Scandinavia, although not unknown among mountainous and woody regions southwards, as far as the Alps of Savoy and the Veronese. Although rather difficult to rear in Britain, the capercaillie is often domesticated in Sweden, where it becomes so tame as to eat familiarly from the hand. Though naturally shy and wary, they sometimes, even in their unreclaimed condition, manifest a singular and unaccountable degree of boldness. Mr Brehm mentions a cock bird that inhabited a wood near Renthendorf, through which there was a roadway, and whenever any one passed through, it would fly towards him, peck at his legs, and strike him with its wings. The black-cock (*T. tetrix*) is a smaller, but very beautiful species, of hardy habits, and much on the increase in many parts of Britain, where it prefers alpine pastures, with a sprinkling of natural wood, intermingled with moist places covered by long coarse herbage. It is widely dispersed over the northern and temperate parts of Europe, and spreads somewhat farther south than the preceding, being found, though rarely, on the Apennines. We know that it breeds among the lofty hills above Albenga, near the Colle de Tende. Other species of bare-toed grouse occur in Europe, and a still greater number in North America. For the history of the latter we must refer to the well-known works of Alexander Wilson, C. L. Bonaparte, Audubon, Richardson, and others.

Of the feather-footed game-birds (genus *LAGOPUS*), the most noted for gastronomic excellence is our common red grouse, or moor-game (*L. Scoticus*), so highly prized and eagerly pursued by sportsmen. This well-known species restricts itself chiefly to the sides of sloping mountains, and those extensive tracts of elevated land called moors, where it is careless of other shelter than that afforded by the natural roughness of the ground, and its plentiful covering of heath, or other alpine plants of still more lowly growth. The most singular fact in its history is its restriction to Great Britain and Ireland,—all other parts of the world, from “Indus to the pole,” being sought in vain for a single example. In this little group we also place the ptarmigans, distinguished from the other grouse by the assumption of a snow-white plumage during winter. These birds seem to prefer, in comparatively temperate climates, such as that of Scotland, the bare and stony sides or summits of the highest mountains; but under the rigorous temperature of Greenland, and the most northern portions

Rasores. of America, they are chiefly found in the vicinity of the sea-shore, by the banks of rivers, and among the willow and other copse woods of the lower and more sheltered vales. The species of Europe and America are not yet in all respects sufficiently characterized and distinguished.

The genus *PTEROCLES*, Temm., has a naked space around the eye, but not of a scarlet colour, as in grouse; the toes are bare, the hind one very small, and the tail pointed (Plate CCCXCVIII. fig. 6). These birds, called gangas, or sand-grouse, live in sandy plains and deserts in the warmer regions of Asia and Africa, although two species, *Pt. arenarius* and *setarius*, Temm., inhabit some of the southern countries of Europe, especially Spain. The latter is the pin-tailed grouse of Latham, *Tetrao alchata*, Gmelin.

The genus *PERDIX* of Brisson contains the partridges, distinguished by having the legs or tarsi bare, as well as the toes. The tail is also very short, although of greater length among the kind called francolins, and other foreign species. Of these several are armed with spurs; and one especially, the sanguine partridge (*P. cruentata*, Temm.), has sometimes three or four spurs on each leg. The francolins perch on trees. The partridges properly so called always rest upon the ground. Their bill is not so strong, and their spurs, if they have any, are very short, or simply tubercular. Four or five sorts are found in Europe, although the common gray partridge (*P. cinerea*) is our only truly indigenous kind. The red-legged partridge (*P. rubra*), which in Italy is the most frequent, has been introduced of late years into the south of England, where it continues to breed spontaneously in a state of nature. Many other species occur in foreign countries.

The quails (genus *COTURNIX*) are of smaller size than the preceding, the tail is still shorter, the spurs are wanting, and there is no coloured space above the eye. The only British species is the common quail (*C. Europeanus*), a well-known bird of passage, generally but not abundantly distributed over the island. In Scotland it is even scarce, although we have found it occasionally near Edinburgh, as well as in Ross-shire, and along the coasts of Aberdeen and Kincardine. The whole migrate from the colder and temperate parts of Europe during autumn, and re-appear in spring, in certain places, in enormous numbers. Along the Neapolitan coasts, for example, 100,000 have been taken in a single day. In some of the southern countries of Europe, however, many quails remain throughout the winter. In Portugal they are even more numerous during that season than in summer; and Signor Savi says, in regard to those of Italy, “Sono le quaglie uccelli viaggiatori, giacchè la massima parte lasciano l'Europa, traversano il mare, e vanno a passare il verno in Africa, ed in Asia; ma di Toscana, come pure dalle altri parti meridionali, non partono tutti, anzi una gran quantità ne resta per le stoppie delle nostre Maremme, ove trovano e molto nutrimento e dolce clima. Negli ultimi giorni d'Aprile si rimettono in moto; e quelle che avevan passate il mare lo passan di nuovo, e quelle che eransi ritirate ne' siti aprici si spargon per tutti i campi e prati.”² A vast number of quails of various kinds are found in foreign countries. A beautiful small species (*C. excalfactoria*, Temm.,—*P. Chinensis*, Lath.) is very abundant in China, where it is bred in the domestic state, and kept in cages for the singular purpose of warming people's hands in winter. It is also patronised on account of its pugnacious disposition, being fought with its own kind, as common cocks are in this country.

The American quails now form the genus *ORTYX*, and are in some measure intermediate between the true quails and partridges. The bill is thick and strong, but short

¹ *Wanderings*, &c. vol. ii. p. 61.

² *Ornitologia Toscana*, tom. ii. p. 200.

Rasores. and rounded; the tail more lengthened than in those of the old continent. One species, *O. Californica*, has the head ornamented by a beautiful slender recurved crest. (See Plate CCCXCVIII. fig. 7.) Several other kinds were recently discovered and described by the lamented Douglas, the botanical traveller and collector, whose tragical fate in the Sandwich Islands recently excited the sympathy of the scientific world. They differ from the ordinary quails in usually perching upon trees at night. The Virginian Ortyx, *O. borealis*, has of late years been reared in several parts of England, and is now almost naturalised in Sussex. It is considerably larger than the common quail.

The genus ORTYGIS of Illiger resembles the quails in general form, but the bill is somewhat compressed. The toes are so deeply divided, as scarcely to exhibit a vestige of the usual intervening membrane, and the hind toe is wanting. The species are of small size, and occur in India, Africa, and New Holland. They are of polygamous habits, and dwell in barren places on the confines of deserts, seldom taking wing except when closely run. One of these birds is also much used by the Malays and other eastern nations for fighting with its kind. (See Plate CCCXCVIII. fig. 9.)

A bird of a very anomalous aspect and character, called the heteroclyte grouse (*Tetrao paradoxus* of Pallas), now forms the genus SYRRHAPTES of Illiger. The bill is rather slender and compressed, straight, but as usual somewhat bent towards the tip. The tarsi are short and densely clothed with feathers; the toes are also very short and feathered, and connected together almost to the claws. The hind toe is not wanting, but seems buried in the feathers. The wings and tail are very long, and are both terminated by lengthened slender-pointed plumes. The only known species (named *S. Pallasii* by M. Temminck), inhabits the deserts of Tartary, near the shores of Lake Baikal. Owing to the peculiar structure of its feet, it can scarcely move upon the ground; but its flight is brisk and rapid, though seldom long sustained.

The last group we shall here mention contains the *Tinamous*—genus TINAMUS, Lath.,—*Crypturus*, Illig. (Plate CCCXCVIII. fig. 8.) The bill is lengthened and slender, slightly arched, blunt-pointed, grooved on each side, the nostrils central, deepening obliquely backwards. The wings are short, the tail almost rudimentary. The palmation at the base of the toes is very short; and the hind toe, reduced almost to a little spur, does not reach the ground. The bare space around the eye is very circumscribed. These birds abound in the Brazilian and other tropical forests of America, where they run swiftly, seldom fly, conceal themselves among long herbage, and perch (as some say) upon the lower branches of trees. They live on fruits and insects, and their flesh is much esteemed. Rather than exercise their natural powers of flight, they will sometimes foolishly allow themselves to be killed in great numbers with a stick. They are also hunted with dogs. They build upon the ground, and their eggs are remarkable among those of gallinaceous birds for their brilliant tinting, some being bright blue, others of a brilliant violet colour. The different species of Tinamous exhibit a great diversity in size, from that of a pheasant to a very small quail; and “as for their flesh,” says Mr Swainson, “we have often tasted it, and consider it, both in whiteness and flavour, infinitely above that of the partridge

or pheasant. We believe these birds never perch, as some suppose, but that they live entirely among herbage, principally in the more open tracts of the interior.”¹ Rasores.

The great family of the pigeons (COLUMBA, Linn.) comes next in order in Baron Cuvier's arrangement, and in that indeed of most of our systematic writers. There are several circumstances, however, which make it doubtful whether the pigeons should not form either a separate order of themselves, or undergo some other change in their position. As compared with ordinary gallinaceous birds, every one will admit that they present numerous and striking disparities. Their powers of flight, for example, if equalled are not surpassed even by those of the falcon tribe, their habits are monogamous, their haunts very generally arboreal, their eggs few in number, and hatched by the male as well as female, the young are at first extremely helpless, and are fed for a length of time from the crop of both parents,—in all these points, and many more, they differ remarkably from other gallinaceous birds. Professor Savi, we observe, places the pigeons in his concluding tribe of Passeres (*Uccelli silvani*), as a connecting link with the gallinaceous order, and for reasons closely corresponding with those we have just assigned.² Mr Macgillivray has recently observed, that “the beautiful, very extensive, and generally distributed family of birds commonly known by the names of pigeons, doves, and turtle-doves, appears to form an order of itself, separated by well-defined limits; but yet, as in other cases, presenting modifications of form indicative of its affinity to conterminous groups. The peculiar shape of the head and bill, more than any other external feature, serves to render the different species readily cognizable as belonging to a single tribe; for, whatever may be the size, colour, or even shape, of a pigeon, it cannot be mistaken. But the relations of the family, it would appear, are not so readily perceived,—some of our most approved systematists having associated them with the passerine, others with the gallinaceous birds,—while a few consider them as constituting a distinct group. Linnæus included them all under the single genus Columba, which has merely been sectioned by M. Temminck, and from which M. Vieillot has only separated two genera under the names of Treron and Lophyrus; while Mr Swainson and other Ornithologists have converted it into several generic groups, such as Vinago, including the thick-billed species, Ptilonopus, Columba, Turtur, Ectopistes, Peristera, and others, characterized by differences in the wings and tail; and Lophyrus, formed, by Vieillot, of the great crowned-pigeon. The latter seems to connect this family with the Cracinae, which belong to the gallinaceous order, while other groups manifest an affinity to the partridges and allied genera. The pigeons vary much in form, some having the body full, others slender; while the tail is very short, moderate, or greatly elongated. In all, however, the head is small, oblong, compressed, with the forehead rounded; a circumstance depending partly upon the form of the skull, and partly upon the absence of feathers at the base of the bill. The latter organ is characterized more especially by having the nasal membrane bare, generally scurfy, fleshy, and tumid, with the narrow longitudinal nostrils placed under its anterior margin. It varies in size, but the upper mandible has its ridge always obliterated at the base by the encroachment of the nasal membranes, and its extre-

¹ Nat. Hist. and Class. of Birds, vol. ii. p. 168.

² “Questa tribù forma il passaggio dai Silvani ai Gallinacei, giacchè i Piccioni, quantunque somigliano più ai primi che ai secondi, pure han caratteri comuni agli uni ed agli altri. Somigliano i Silvani, perchè avendo ali grandi e coda larga, volano facilmente, con velocità, ed a grandi distanze; sono monogami: nascono nudi, e per un tempo assai lungo (almeno per tutte le specie nostrali) non essendo capaci nè di muoversi, nè di cercare il cibo, han bisogno d'esser covati, e imbeccati da' loro genitori: fanno il nido sugli alberi, o nelle buche. Somigliano poi i Gallinacei per avere un gozzo molto dilatabile, e dove gli alimenti si trattengono e provano una certa preparazione alla digestione: i semi, di cui quasi esclusivamente si cibano, li inghiottiscono senza sbucciareli, o romperli, e finalmente, come i Gallinacei, hanno lo sterno doppiamente scavato.” (*Ornitologia Toscana*, tom. ii. p. 152.)

Rasores. mity horny, arched, or convex, more or less compressed, with a blunt thin-edged point. The tongue is fleshy, tapering to a point, and triangular in its transverse section. The throat is very narrow. The œsophagus is of moderate width, but expanded, or opening into a large crop, placed on the lower part of the neck and the fore part of the breast, and terminates below in an oblong proventriculus, completely surrounded with large oblong glandules. The stomach is a powerful gizzard of a somewhat rhomboidal form, and furnished with two very thick lateral muscles inserted into two tendinous centres, with an inferior thinner muscle inserted into the same tendons. The intestine is long and slender; the cæca very small and cylindrical; the rectum very short, and but slightly enlarged. The tarsi are generally short and stout, either scutellate or feathered. The foot is of that kind equally adapted for walking and perching, having three toes before and one behind; the middle toe considerably longer than the two lateral, which are nearly equal, and the hind toe directed backwards, and shorter than the lateral. They are covered above with numerous short scutella, laterally margined, beneath flat and papillate. The claws are short, compressed, moderately arched, rather blunt. The plumage is various, so that no general character can be derived from it, farther than that the feathers have the tube very short, the shaft commonly thick, and are entirely destitute of the accessory plumule, which is largely developed in the gallinaceous birds. The wings are for the most part large, more or less pointed, with the second, third, and fourth quills longest; but the primary quills vary in form, and present several very curious modifications. The tail is even, rounded, cuneate, or graduated.¹ The skeleton, Mr Macgillivray further remarks, differs very materially from that of gallinaceous birds, and the intestine is much longer, the difference, however, in the other Gallinæ being made up by the great development of the cæca, which in pigeons are merely rudimentary, that is, extremely small, and secreting only a mucous fluid. We may add the following important character, that the hind toe is articulated on the same plane with the three anterior ones, instead of being placed higher up, as in the rest of the gallinaceous order. Although their legs are short, pigeons walk with great ease and considerable celerity.

These beautiful birds abound in most of the temperate and tropical regions of the earth, being, however, both more numerous and more gorgeously attired in the latter, where they often rival even the tribe of parrots in the splendour of their plumage, and literally realize the delightful expressions of the Holy Scripture—"as the wings of a dove covered with silver, and her feathers with yellow gold." The old genus *Columba* is one of the most cosmopolite with which we are acquainted, being found diffused alike through Europe, Asia, Africa, and America; and even in the forests of the far-distant Southern Ocean, their radiant plumage

Fills many a dark obscure recess
With lustre of a saintly show.

In no tribe of the feathered race do we meet with more to delight the eye by its richness and diversity. "In some," says Mr Selby, "the plumage shines with a dazzling and metallic gloss, varying in tint with every motion of the bird, and which vies in lustre with that of the diminutive and sparkling humming-birds. In texture the plumage is generally close and adpressed, and the feathers feel hard and firm to the touch, from the thickness and strength of

the rachis or shaft. Upon the neck they assume a variety of forms, in some species being rounded and stiff, and disposed in a scale-like fashion; in others of an open, disunited texture, or with the tips divided and curiously notched; and in the hackled and Nicobar pigeons they are long, acuminate, and laciniated, like those of the domestic cock; and, we may add, that in nearly all they are so constituted as to reflect prismatic colours when held at various angles to the light."²

The vast variety of species and numerous sub-genera of which the *Columbidæ* are now composed render a full exposition impossible. We must, indeed, rest satisfied with a very brief notice of a few remarkable kinds. We have four species of pigeon in Britain, and we are not aware that more occur in Europe.

1st, The ring-dove, cushat, or wood-pigeon, *C. palumbus*, Linn., a large, beautiful, and well-known species, very generally distributed over the more or less wooded districts of our island, but avoiding bare and rocky regions. It breeds on trees in single isolated pairs, but is often gregarious to a great extent in winter. It is a wary bird, of powerful wing, not easily approached even in the forest glades, yet not seldom building in groves or groups of trees in the immediate vicinity of human dwellings; and we have seen a gentle pair sitting for hours upon the branches of an almost leafless sycamore in early spring, preening their feathers in assured confidence, within a few footsteps of our cottage door. Indeed we have often noticed, as others must have also done, what may be called the *discrimination* of birds, in relation both to persons and to places. We allude to what we should call their accommodating rather than their natural instincts,—how, for example, after a season or two of observation or experience, they will congregate around a spot where no rude hands disturb their mossy dwellings, nor climbing urchin shows his visage grim among the umbrageous boughs. This is beautifully exemplified (and on a greater scale than in a cottage garden) among the gladsome palace-groves of the Tuileries and Luxembourg in Paris, where, notwithstanding the gay and giddy stream of human life which flows for ever through those royal walks, the wood-pigeon builds her frequent nest, though far her flight to rural solitudes for every offering which she brings her much-loved young. This species generally breeds twice a year.

2dly, The rock or wild pigeon, *C. livia*, Briss., a smaller species, totally regardless of all the leafy glories of the forest, but loving devotedly the craggy cliffs and hollow caverns by the ocean-shore. This species is believed to be the original of our common domestic breed, of which the numerous and extraordinary, yet, with proper care, permanent varieties, are among the more puzzling problems of Ornithology.³

3d, The smaller wood-pigeon, erroneously called the stock-dove, *C. œnas*, Linn. This bird is much more limited in its distribution than either of the preceding, being as yet unknown in Scotland, and frequenting chiefly the southern and midland counties of the sister kingdom. It is almost entirely confined to wooded districts, its habits, according to Mr Selby, being strictly arboreal; yet Mr Salmon records it as abounding in heaths and rabbit warrens in the neighbourhood of Thetford, to which it annually resorts for the purpose of nidification.⁴

4th, The turtle-dove, *C. turtur*, Linn., a small and delicate species, unknown in "bleak Caledonia," but a constant summer bird in Kent, and other counties of the south of

¹ *British Birds*, vol. i. p. 249.

² *Naturalist's Library*, vol. v. p. 88.

³ For the domestic breeds, see Temminck's *Hist. Nat. Gén. des Pigeons et des Gallinacées*, MM. Boitard and Corbie's *Monographies des Pigeons Domestiques*, the *Pigeon Fancier*, and other works.

⁴ *Magazine of Natural History*, vol. ix. p. 520.

Rasores. England, where it breeds in woods. It is sometimes seen towards the end of summer in little flocks of a score or two together. This bird leaves Britain in the course of the autumn, and does not to our knowledge remain in any part of Europe throughout the winter season.

Of the exotic pigeons one of the most remarkable is the goura, or great-crowned pigeon, *Lophyrus coronatus*, Vieillot (see Plate CCCXCIX. fig. 1). It is by far the largest of the tribe, measuring nearly two feet and a half in length. It inhabits Java, New Guinea, and most of the Molucca Islands, and is occasionally brought alive to Europe, where, however, the climate is too moist and variable to admit of its ever attaining to a good old age.

One of the most magnificent of the tribe is the hackled pigeon (*C. Franciæ*), distinguished by the irregular form of the feathers on the head, neck, and breast, which are long and narrow, and terminate in a shining appendage resembling in consistence, though not in colour, the tips of the wing-feathers of the waxen chattering. It inhabits Southern Africa and the island of Madagascar. Another singular species is the parabolic pigeon (*C. arquatrix*), discovered by Vaillant, and figured in his splendid work on the birds of Africa. The flight of this bird is very remarkable. It never proceeds in a straight line, but on commencing its route describes a parabola, and continues forming a series of arcs during the whole time, frequently uttering a peculiar cry. It inhabits the forests of Antiquois, and is so bold as to persecute the white eagle.

The carunculated pigeon (*C. carunculata*, Temm.) is placed by Mr Selby with the ground doves, genus *Geophilus* of that author. This little group is not only distinguished by a greater length of tarsus and other organic characters, but by a striking departure from the general economy of the Columbidae, the number of eggs not being confined to two, but extending to eight or ten. Incubation also takes place upon the ground; and the young, like those of the true gallinaceous birds, are produced from the egg in so matured a state as to follow their parents from the first. They live entirely on the ground, but roost at night on trees and bushes. The carunculated species just referred to is observed by M. Temminck to show a strong resemblance to the gallinaceous tribes both in aspect and manners. The fleshy scarlet lobes around the eyes and throat correspond, it is supposed, to the wattles of domestic poultry. It builds its nest in slight depressions on the ground, of twigs and stems of grass, and lays from six to eight eggs, which are sat upon alternately by male and female. The young are able to follow their parents as soon as hatched, and are led about by them, and brooded over with extended wings. Their first food consists chiefly of the larvæ of ants and other insects, and when greater strength is gained, of seeds and berries. The beautiful Nicobar pigeon (*C. Nicobarica*, Lath.) has been likewise referred to the same genus. Though of a heavy form and ungraceful carriage, it yields to none of its tribe in splendour of plumage, of which the prevailing hue is rich metallic green, with various reflections of copper and purplish red. It is generally described as residing habitually upon the ground, where it runs with great celerity,—perching on the lower limbs of trees at night. Yet Mr Bennet alludes to this species as usually seen perched on trees, even on the loftiest branches,—where, he adds, it rears its young “similar to all the pigeon tribe.”¹ It inhabits Nicobar, Java, Sumatra, and other eastern islands.

We have already alluded briefly to the turtle-dove. The most common kind in cages, in this country, is not the English species, but that called the laughing or collared turtle, *T. risorius* (*torquatus*, Briss.). It is bred with great

facility in Britain, but the winter cold would probably be too much for it out of doors; and it seems, moreover, to want that instinct of local attachment which induces our common pigeon to continue in the place where it was born and bred. In its natural state this species occurs in various parts of Africa.

Somewhat resembling the turtles in the length of its wings and tail is the famous passenger pigeon of America, of whose rapid flight and countless congregations we have such graphic accounts in the delightful pages of Wilson and Audubon. This bird is the *Columba migratoria* of authors, and is placed by Mr Swainson in his genus *Ectopistes*. It may be presumed to be sufficiently common in North America, from a fact, or rather calculation, given by Alexander Wilson. He estimated a flock which continued to pass above him for the greater part of a day, to have been a mile in breadth, and 240 miles in length, and to have contained (three birds being assigned to every square yard), at least *two thousand two hundred and thirty million two hundred and seventy-two thousand pigeons*! Mr Audubon confirms his predecessor's account by a narrative still more extraordinary; and adds, that as every pigeon consumes fully half a pint of food (chiefly mast), the quantity necessary for supplying his flock must have amounted to *eight millions seven hundred and twelve thousand bushels per day*!² We wonder, after this, that any farmer should ever dare to migrate to America.

The genus *VINAGO* of Cuvier consists of pigeons with strong solid compressed bills, short tarsi, and broad distinctly bordered feet. They inhabit forests, live on fruits and berries, and occur in the tropical regions of the old world. Their prevailing colours are various shades of green and yellow, contrasted with purple or reddish brown. The *Columba aromatica* of Latham is a Vinago. (See Plate CCCXCIX. fig. 3.)

We shall now close our brief sketch of the gallinaceous order.

ORDER V.—GRALLATOIRES.³

SHORE-BIRDS, OR WADERS.

The characters of this order, so far as they can be formally stated, are as follows. The shape of the bill is indeterminate. The legs are long and slender, and more or less bare above the tarsus. There are three anterior toes, more or less united at their bases by a membrane or rudimentary web. The hind toe is wanting in one division of the order.

Among the extensive and varied tribes which constitute the grallatorial order, the bill, as we have just intimated, is formed after so many different models (though always in beautiful accordance with the habits of each particular group), that its structure cannot be generalised, or sententiously expressed. The structure of the feet and legs is also admirably adapted for the exercise of their peculiar habits of life, being so lengthened as to admit of the species wading to a considerable depth without wetting their feathers, and of running with great rapidity along the margins of lakes and rivers, or the sea's more sandy shores. It is to this length of limb that they owe the name of *Grallatores*, as if they went on stilts. The French title of *echassiers* is also derived from the resemblance which the legs bear to the *echasses*, so frequently used by the natives of the *landes* of Aquitaine. A too exclusive attention, however, to this character seems to have misled some modern naturalists, who have included several very remotely

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¹ *Wanderings*, &c. vol. ii. p. 64.

² See his interesting account of the passenger-pigeon, in *Ornithological Biography*, vol. i. p. 319–26.

³ GRALLÆ, Linn.

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allied genera under one order. Indeed a considerable diversity of opinion exists as to what ought to form the component parts of the grallatorial order. By means of the flamingoes and others, they are closely allied to the natorial or web-footed birds,—while a dismemberment, partly from the latter order, partly from the original Grallæ, has been advocated in favour of the Grebes, Phalaropes, &c. as a separate and intermediate division under the name of *Pinatipedes*.

The Grallatores seek their food in marshes, and along the banks of rivers and the shores of lakes. They also frequent the sea-coasts, where many kinds, especially in autumn, congregate in numerous flocks. But although the habits of the majority are littoral, many haunt habitually the arid deserts, the green and sedgy meadows, or the upland moors. Who knows not the plover's wailing cry among the desolate mountains,—the curlew's shrilly voice, “a viewless spirit of the elements,” far up amid those scenes of pastoral melancholy, where the lonely rocks seem sometimes silent as gigantic spectres, and anon resound with varied and innumerable bleatings, as some gray-haired shepherd, “loving the land which once he gloried in,” his dog his sole companion, gently leads along the fleecy people? In truth we often seek in vain to generalise the habits of the feathered race. In our systems we can give them both a local habitation and a name, but in nature they have wings, and like the wind travel where'er they please, and no philosopher either from field or college can say from whence they come, or whither they are going. The food of our present order varies according to the form of the mandibles. Such species as are provided with a long, hard, sharp-pointed bill, as in the heron tribe, live on fish and reptiles; the species in which that organ is softer and more flexible feed on worms and insects, whilst a more limited number, for example the land-rail (*Rallus crex*), are partly granivorous, and consequently affect a drier soil. The jacana (*P. chavaria*) is said to feed on grass. The habits of many species are migratory; and it has been remarked, that the young and old birds always perform their journeys in separate assemblages. A great proportion of the order congregates in the southern countries of Europe before the arrival of winter,—a season which many of them are supposed to spend in Africa. A few are winter birds of passage, that is to say, the temperate countries of Europe form their southern boundary, and during the breeding season they seek the colder regions of the north. The woodcock breeds in Scandinavia, where the observant traveller may frequently see it, not as with us the harbinger of storms, but darting across his dappled dusty path “in the leafy month of June.” However, in several parts of the north of Scotland, woodcocks are now very frequent throughout the summer season, rearing their absurd-looking, long-billed progeny along the banks of the Dee, or in the well-wooded valleys of the eastern parts of Ross-shire. The smaller species, such as rails and sandpipers, run with great celerity; the paces of the larger kinds are more measured and sedate. During flight the legs in many kinds are extended on a line with the body. In some entire genera, and in certain species of other genera, the moult is double, that is, takes place both in spring and autumn, and occasions a great disparity between the plumage of the winter and summer seasons. The attire of the sexes is for the most part not very dissimilar. An apparent non-conformity may be said to exist in a few of the species, between the structure of the feet and the functions of these organs, which would disenable us from indicating, *a priori*, the habits of such species merely from an inspection of their organization. For example, the waterhen (*Fulica chloropus*) is an excellent and constant swim-

mer, and much more strictly aquatic than the avocet or flamingo, yet its toes are long and deeply divided, and furnished with an extremely narrow rudimentary web, while the last-named species, though semi-palmated, never voluntarily venture beyond their depth.

The migratory movements of the Grallatores are probably determined in a great measure by the necessity of obtaining suitable nourishment. The rigour of a Scandinavian winter, which entirely congeals the surface of the moist forest-lands of Sweden and the swamps of Lapland, drives the woodcock to seek its food in the comparatively milder copses of Britain and Ireland; while the landrail, which is with us a native or summer bird, migrates in autumn to more southern regions, where it is probably known only as a winter visitant. Analogous facts have been observed in various parts of the world. Thus in regard to North America, the Grallatores, feeding by preference in marshy and undrained lands, frequent the Saskatchewan prairies only in the spring; and as soon as the warm and comparatively early summer has rendered the soil too dry for their accustomed purposes, they retire to their breeding places within the arctic circle. “There,” says Dr Richardson, “the frozen sub-soil, acted upon by the rays of a sun constantly above the horizon, keeps the surface wet and spongy during the two short summer months, which suffice these birds for rearing their young. This office performed, they depart to the southward, and halt in the autumn on the flat shores of Hudson's Bay, which, owing to the accumulations of ice drifted into the bay from the northward, are kept in a low temperature all the summer, and are not thawed to the same extent with the more interior arctic lands before the beginning of autumn. They quit their haunts on the setting in of the September frosts, and passing along the coasts of the United States, retire within the tropics in the winter.”

The majority of the Grallatores are swift and powerful flyers, being provided with rather long, acutely-pointed wings; but to these attributes we have a few strong and singular exceptions in such birds as the ostriches and casuaries, which have scarcely any wings, and cannot fly at all.

Baron Cuvier has established the five following tribes among the Grallatores, viz. BREVIPENNES, PRESSIROSTRES, CULTRIROSTRES, LONGIROSTRES, MACRODACTYLES.

TRIBE 1ST.—BREVIPENNES.

The small number of gigantic birds which constitute our present tribe differ greatly, not only from the other Grallæ, but from all known species; 1st, in the extreme shortness of their wings, which, though no doubt useful in their way, are altogether destitute of power to raise their bodies from the earth; and, 2dly, in the sternum or breastbone being destitute of a ridge or keel. The muscles of the breast are also extremely slight and thin. “Il paraît,” says Cuvier, “que les forces musculaires, dont la nature dispose, auraient été insuffisantes pour mouvoir des ailes aussi étendues que la masse de ces oiseaux les aurait exigées pour se soutenir en l'air.”² This is not expressed according to the English mode of thought and feeling, but it may pass for what it means. To make amends, however, for this supposed incapacity of nature, we find that the muscles of the legs have received an enormous development, which enables the species to run almost with the rapidity of race-horses, and to be thus independent of aerial flight. In some of our modern systems these birds form the family *Struthionidæ*, and are placed in the gallinaceous order.

In the genus *STRUTHIO*, which contains the true ostrich,

¹ *Fauna Borcali-Americana*, part ii. Introduc. p. xix.

² *Règne Animal*, tom. i. p. 494.

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the wings are adorned by loose flexible plumes, and though of small extent, are still sufficient to afford effectual aid in running. The toes, at least externally, are only two in number.

The only known species is the ostrich commonly so called (*Struthio camelus*, Linn., Plate CCCXCIX. fig. 5), a bird which forms one of the most remarkable characters in the Ornithology of Africa, to which country it is believed to be almost entirely peculiar. It presents the tallest, and in many other respects the most singular example of the feathered race. It measures from six to seven feet in height; its head is very flat, extremely small, and almost naked; as is also the upper portion of the neck, which is very slender, and nearly three feet long. The general plumage of the male is black, varied with white and gray, the fine full feathers of the wings and tail being either black or white. Our engraving will best explain its outer aspect. The female is brown or ashy-gray upon the body; the young are likewise of the latter hue, and have at first the head and neck densely clothed. The ostrich inhabits the deserts of Arabia, and a vast extent of open sandy plains in Africa, from Barbary to the Cape of Good Hope. Being consequently native to one of the most anciently peopled countries of the earth, it has excited the attention of mankind from the remotest periods of antiquity. It is frequently mentioned in the book of Job, and in other portions of the Old Testament. Herodotus among the early Greek writers was well acquainted with its history and appearance, and in after times it was not only frequently exhibited by the Romans in their games, but the brains of hundreds at a time were scooped out as a choice delicacy for the luxurious table of Heliogabalus.

The ostrich is gregarious and polygamous. The female deposits her eggs, weighing nearly three pounds, in the sand. These, in equatorial regions, are hatched by the heat of the sun, with little or no attention on the part of the mother; but on either side of the tropics are said to be incubated in the usual fashion. This gigantic bird feeds naturally on seeds and herbage; but its taste is so obtuse, and its swallowing propensities so universal, that there are few substances, however incongruous or indigestible, which it declines. It is said by some to be the swiftest of all running creatures, and Adanson seemed satisfied that those he saw at Podor, a French factory on the southern side of the Niger, would have distanced the fleetest race-horse that was ever bred in England. There is no doubt that the peculiar construction of birds, in relation both to the respiratory and circulating systems, is such as to admit of their keeping in much better *wind* than is possible for any quadruped; and when, as in the case of the species in question, great muscular power is superadded, the natural result must be prodigious swiftness.

The nandou or American ostrich now forms the genus *RHEA*, of which it is the sole species, characterized by having three toes, the wings terminated by a little spur, and the tail wanting. It is not above half the size of an ostrich, of a whitish-gray, lead coloured on the back, the head covered with close-set blackish feathers, almost as stiff as hair. This bird inhabits the pampas of Paraguay, in troops of a few dozen, and extends almost as far south as the Straits of Magellan. It is a gentle, innocent creature, of herbivorous habits, easily tamed if taken young, and laying an enormous number of eggs. As several females sometimes sit together, it is probable that the number of seventy or eighty eggs, alleged to have been found in a single nest, are not the produce of one bird, but rather

the result of a kind of joint-stock incubating company. Its flesh is eaten by the Indians, and its feathers, from their peculiar structure, make very good hair-brooms.

In the genus *CASUARIUS*, the wings are still shorter than in either of the preceding, and seem of no use even in running. They consist, in fact, merely of a few hard, stiff, sharp-pointed, barbed shafts. The head is surmounted by a bony crest, and the bill is laterally compressed (see Plate CCCXCIX. fig. 2). The sole species is the common cassuary (*C. galeatus*, Vieil.), a bird first imported to Europe by the Dutch in 1597. Like the rest of its tribe, it is extremely large, measuring about five feet in height. Its plumage is very peculiar, being long, narrow, decomposed, and hair-like, and the *plumule*, or short inner feather (which exists in almost all birds except pigeons), is of nearly equal length with the outer portion, so that an appearance is produced of there being a double feather to each quill. The prevailing colour is blackish. The cassuary inhabits the Moluccas, Ceram, Bourou, and especially New Guinea. These birds usually live in pairs, and the female lays three eggs, of a greenish hue, and punctured surface. They run with great swiftness, and defend themselves from dogs and other animals, by kicking like horses. The inner claw is very large and strong.

The emeu, or New Holland cassuary, forms the genus *DROMECIUS* of Vieillot. The bill is much depressed, the head feathered, without osseous crest, the throat naked. The claws are of nearly equal length. The general colour is dull brown mottled with dingy gray; the young are striped with black. The plumule is equally extended as in the preceding species. (See Plate CCCXCIX. fig. 6.) Next to the ostrich, the emeu is the tallest bird we know. Its flesh affords admirable eating,—"truly exquisite," says Peron, "and intermediate, as it were, between that of a turkey and a sucking pig." Mr Cunningham compares it to beef, which is also an excellent thing. This bird is widely spread over the southern parts of New Holland and the adjacent islands. It is tamed with great ease, and of late years has frequently been bred in Britain.

In the genus *APTERYX* of Shaw,¹ the bill is slender and of considerable length, the legs short, with three anterior toes, and a posterior spur to represent the hallux. The wings are rudimentary. The only known species was obtained a good many years ago on the south coast of New Zealand, by Captain Barclay of the ship *Providence*, and was presented by him to Dr Shaw. It equals a goose in size. This bird, of which the history was long obscure, has been recently received in London.²

The last ornithological form to which we shall allude under our present tribe is the mysterious Dobo (*Didus ineptus*), a bird which some regard as an extinct, others as a fabulous, species. In neither supposition would it fall within the limits of our present treatise, which seeks to present a sketch, however imperfect, of living nature; and we shall therefore not occupy our narrow limits by a subject of "doubtful disputation," on which we cannot ourselves throw any light, having neither been in the Mauritius, nor studied the works of Clusius and the early Dutch navigators.³

TRIBE 2D.—PRESSIROSTRES.

This tribe consists of the bustards, plovers, and other species which, like all the preceding, either want the hind toe, or have it so short as not to touch the ground. The bill is of medium size, but of sufficient strength to pierce the ground in search of worms and insects, the feebler

¹ *Naturalist's Miscellany*, pl. 1057-8.

² Yarrell, in *Zool. Trans.* i. pl. 10.

³ Whoever desires it, will find a summary view of authorities regarding the dodo, by Mr T. S. Duncan, in the *Zoological Journal*, N^{o.} xii. p. 554

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species often frequenting moist meadows and tilled ground in search of food. The stronger billed kinds feed also on grain, &c.

The genus *OTIS*, Linn., possesses the bulky massive form of the gallinaceous order, and the upper mandible is somewhat arched; but the bare space above the tarsus, the want of the hind toe, and the general structure both outward and internal, connect them more closely with the Grallatores. The great bustard (*Otis tarda*) is the largest of the European birds, and one of the rarest of our British species. It sometimes weighs nearly thirty pounds, and is now believed to be confined exclusively to Norfolk. We have another species called the little bustard (*O. tetra*), also very rare. Many fine species occur in Africa and the East. (See Plate CCCXCIX. fig. 4.)

The genus *CHARADRIUS*, Linn., likewise wants the hind toe. The bill is compressed, and somewhat enlarged towards the tip. It contains the various species commonly called plovers, and may be divided into two. 1st, *ÆDICNEMUS*, Temm., in which there is an inflation towards the terminal portion of the bill in both mandibles, and the nasal fossæ are less prolonged. These are the larger species, of which the great plover (*Ædic. crepitans*), or thick-knee'd bustard of our English writers, affords a good example. It is a migratory bird, of rare occurrence, confined chiefly to our southern and eastern counties, which it visits about the end of April. It is as yet unknown in Scotland. This bird is a nocturnal feeder, and preys principally upon insects. 2d, *CHARADRIUS*, in which the bill is inflated only above, and two thirds of its length on each side are occupied by the nasal fossæ, which renders the organ comparatively feeble. The species are gregarious, and, like the gulls, beat the moist soil with their pattering feet, to terrify the incumbent worms. "The members of this genus," says Mr Selby, "are numerous, and possess a very wide geographical distribution, species being found in every quarter of the globe. Some of them, during the greater part of the year, are the inhabitants of open districts and of wild wastes, frequenting both dry and moist situations, and only retire towards the coast during the severity of winter. Others are constantly resident upon the banks or about the mouths of rivers, particularly where the shore consists of small gravel or shingle; such are most of the smaller species. Except during the season of reproduction, most of them live in societies, larger or of less amount, according to the species. Their migrations are also performed in numerous bodies, the old birds usually congregating by themselves, and preceding the young in their periodical flights. They run with much swiftness, as might be expected from the simple structure of their feet; and from the shape and dimensions of their wings, they fly with strength and rapidity. They live on worms, insects, and their larvæ, &c. and most of them are nocturnal feeders, as indicated by their large and prominent eyes. They are subject to the double moult, and the change at the different seasons is in many species very marked. Their nest is on the ground, and their eggs are always four in number. The flesh of the larger species, and such as inhabit the plains of the interior, is delicate and high flavoured; but in many of the smaller kinds, that live on the coast, or on the banks of rivers, it is not so palatable."¹ The beautiful golden plover (*Char. pluvialis*) is the best-known example to which we need refer. The prevailing plumage of the upper parts is brownish, or very deep hair-brown, each feather being tipped and otherwise spotted with yellow. The chin and throat are white, the fore part of the neck, breast, &c. ash-gray, streaked with darker gray, and tinged with

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yellow. During the breeding season, the cheeks, chin, throat, fore part of the neck, centre of the breast, and abdomen, are of an intense black, and in this state it has been erroneously regarded as a distinct species. To the same group belong the dotterel (*Char. morinellus*), the ring-plover (*Char. hiaticula*), and many other kinds, exotic and indigenous. Several of the foreign plovers have sharp spurs upon the anterior margin of the wing, as well as fleshy flattened lobes upon the head.

The genus *VANELLUS* of Bechstein differs but little from the plovers, except in the possession of a small hind toe. We here place our elegant crested lapwing, or green plover (*V. cristatus*), commonly called in Scotland the pees-weep. The gray plover (*C. squatarola*, Linn.) forms the genus *SQUATAROLA* of Cuvier, distinguished, like the preceding, by a very small hind toe; but the bill is more bulged beneath towards the extremity, and the nasal fossæ are short.

The genus *HÆMATOPUS*, Linn., commonly known by the name of oyster-catcher, has the bill rather long, straight, pointed, compressed. The hind toe is wanting. Our British species (*H. ostralegus*), breeds along the rocky ledges of friths and bays, and is said to open oyster and other shells by means of its bill. We could never detect it in the performance of this feat, and we rather doubt the fact, till assured of it by a credible eye-witness. Oysters are by no means easily opened, even with a knife. Several nearly allied species have been discovered of late years in Asia, Africa, and America. One is found in New Holland.

In the genus *CURSURIUS* the bill is slender, rounded, somewhat arched, without furrow. The legs are long, the hind toe wanting. Five or six species occur in Africa and Asia, and of these, *C. Isabellinus*, Meyer, sometimes accidentally appears in the south of Europe. A few specimens have been even seen in Britain.

The genus *MICRODACTYLUS*, Geoffroy (*Dicholophus*, Illiger), has the bill stronger and more curved, with a wider gape. The legs are of great length, the toes slightly palmated at the base, the hinder one very small, and not reaching to the ground. The only known species is a singular South American bird called the çariama or crested screamer (*M. cristatus*, Geoff.,—*Palamedea cristata*, Gm.). It is larger than a heron, the plumage reddish gray waved with brown, the forehead ornamented by a crest of recurved slender feathers (see Plate CCCXCIX. fig. 8). The plumes of the head and neck are also decomposed. The çariama inhabits elevated plains in Brazil and Paraguay, where it feeds on serpents and other reptiles, as well as on insects and their larvæ. It flies feebly, owing to the shortness of its wings, but runs with considerable swiftness. When pursued, it is apt to conceal itself by squatting in some cunning corner. Its flesh affords excellent food, and it is sometimes reared by the Spaniards in a domestic state. The female lays only two eggs.

TRIBE 3D.—CULTRIROSTRES.

In this tribe the bill is usually strong, of considerable length, straight, cutting, sharp-pointed. In many species the trachea undergoes a peculiar duplication in the male sex. The cæca are short. Cuvier divides the tribe into three lesser groups,—the cranes, the herons, and the storks.

The cranes properly so called (genus *GRUS*) have the bill longer than the head. The most noted species is the common crane of Europe (*G. cinerea*), a migratory bird,

¹ *British Ornithology*, vol. ii. p. 230.

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well known in Britain during former ages, and still breeding in the northern and eastern countries of Europe.

Part loosely wing the region, part more wise,
In common, ranged in figure, wing their way,
Intelligent of seasons, and set forth
Their airy caravan high over seas
Flying, and over lands with mutual wing,
Easing their flight; so steers the prudent crane
Her annual voyage, borne on winds, the air
Flotes as they pass, fann'd with unnumber'd plumes.

In our own island the appearance of this bird now-a-days may be regarded as accidental. It is a very large species, measuring above four feet in height. The prevailing plumage is of a deep ash-gray, the face and throat black, the rump and tertial feathers very long, loose, flowing, decomposed.

The whooping crane of the new world (*Grus Americana*) has a pure white plumage, with black primaries. (See Plate CCCC. fig. 1.) This stately bird, when standing erect, measures nearly five feet in height, and is the largest of the feathered inhabitants of the United States (bating Lynch law and the use of tar). It is widely spread over North America, from which it usually retires in winter to the West Indies, although a few hybernate in the warmer parts of the Union, or even linger throughout that inclement season in the swamps of New Jersey, near Cape May. When wounded this crane defends itself with vigour, and has been known to strike its bill through a person's hand with the strength and sharpness of a dagger. It builds upon the ground, and sometimes congregates in vast flocks, the clamour of which is more easily imagined than described. It was heard with astonishment by Captain Amidas, the first Englishman who ever landed in North America, when he visited the island of Wokokou, off the coast of North Carolina. "Such a flock of cranes," says he, "(the most part white) arose under us, with such a cry, redoubled by many echoes, as if an army of men had shouted all together." The bustle of their great migrations, and their passage, as of mighty armies, fill the mind with wonder. Mr Nuttall, while descending the Mississippi in December, observed the whooping cranes in countless thousands, as if assembled from all the swamps and marshes of the north and west,—as if the entire continent was giving up its quota to swell the mighty host. Their flight took place during the night, down the great aerial valley of the river, whose southern course conducted them every instant towards more genial climes. "The clangour of these numerous legions passing along, high in the air, seemed almost deafening; the confused cry of the vast army continued with the lengthened procession, and as the vocal call continued nearly throughout the whole night without intermission, some idea may be formed of the immensity of the numbers now assembled on their annual journey to the regions of the south." Several other fine cranes inhabit America, as well as Africa, and the East.

The beautiful Balearic crane (*A. pavonina*, Linn.) belongs to the genus *ANTHROFOIDES* of Vieillot. (Plate CCCXCIX. fig. 9.) It occurs in Africa and in some of the Mediterranean islands. The *Demoiselle* (*A. virgo*), remarkable for its peculiar and what may be almost called affected gestures, is nearly allied. It is likewise of African origin, as is also the Stanley crane (*Anth. Stanleyanus*), belonging to the same restricted group, and more recently described by Mr Vigers.¹

In the genus *PSOPHIA*, which contains the South American trumpeters, so called from their peculiar voices, the bill is less elongated, and the head and neck clothed with short down-like feathers. *P. crepitans* is easily domesticated, and becomes much attached both to places and to persons. It is even said to act as a guard or conductor to

domestic poultry. It flies indifferently, but runs with great swiftness. (Plate CCCXCIX. fig. 1.) There are only two species.

The genus *ARAMUS* of Vieillot is constituted by the *courliri* of Buffon, or scolopaceous heron, of which the bill, slenderer and more deeply cleft, is inflated towards the tip. The toes, all rather long, have no palmation. The only known species (*Ar. scolopaceus*) inhabits Cayenne, Brazil, and Paraguay, spreading into Florida and other southern parts of the Union. It is a shy and solitary bird, dwelling in pairs, and crying in a loud sonorous voice, continually by night and day, *carau, carau*. It runs swiftly, and builds upon the ground, but often lights on trees. It is not fond of wading.

A still more singular bird, classed by Linnæus with the herons (*Ardea helias*), is the caurale snipe of Latham, which now forms the genus *EURYPYGA* of Illiger. "C'est un oiseau," says Cuvier, "de la taille d'un perdrix, à qui son cou long et menu, sa queue large et étalée, et ses jambes peu élevées, donnent un air tout différent de celui des autres oiseaux de rivage. Son plumage, nuancé par bandes et par lignes, de brun, de fauve, de roux, de gris, et de noir, rappelle les plus beaux papillons de nuit. On le trouve le long des rivières de la Guiane."²

The second group of the cultrirostral tribe, composed chiefly of the herons, is more strictly carnivorous than the preceding.

The first genus is *CANCROMA*, Linn., composed likewise of a single species called the boat-bill—*C. cochlearia*. The bill is comparatively short, but very broad, boat-shaped, with the upper mandible overlapping the lower. It inhabits the moist hot regions of South America, frequenting the banks of rivers, preying on fish, and building its nest on low bushes. It is of an irritable passionate nature, and when enraged raises the feathers of its crest, so as to alter its usual aspect surprisingly. As it scarcely ever frequents the sea-coast, its alleged propensity to feed on crabs is probably ill founded. The boat-bill varies considerably in plumage, but it does not appear that there is more than one authentic species.

The genus *ARDEA*, Cuv., contains the true herons. The bill is as long or longer than the head, strong, hard, straight, compressed, sharp-pointed; the masticating edges sharp, the culmen rounded. The eyes are encircled by a bare skin, which extends to the base of the bill. The herons form a considerable group, almost all of which, according at least to our particular taste, are remarkable for beauty of plumage. They seldom, however, exhibit a preponderance of the brighter or more gaudy colours, such as red or yellow, being chiefly distinguished by a delicate harmonious blending of pearly-gray and brown, black, white, pale blue, slate-colour, and other sober hues. The forms of the plumage are graceful and elegant. Long pendent plumes frequently ornament the hinder portions of the head and neck, the lower part of the breast, and the dorsal region. The body is usually small and light, the limbs long and delicate, the toes narrow and taper, and the neck thin, pliant, and extremely graceful. Many species formerly regarded as true herons are now excluded from the modern genus. The habits of the heron tribe are fully as aquatic as those of the majority of Grallatores. They usually walk, or rather wade, along the shores of lakes, rivers, stagnant marshes, or the land-locked waters of narrow seas, in search of their natural food, which consists of fish, frogs, several marine and fresh-water shells, slugs, worms, and various insects. During flight they extend their legs backwards instinctively, as if to counterbalance the weight of the anterior extremity, and by a duplication of the neck they lower the head between the shoulders. In some instances

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¹ Zool. Journal, vol. ii. p. 234, pl. viii.

² Règne Animal, tom. i. p. 509.

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they are gregarious, in others solitary. In the former case they build in trees,—in the latter, more frequently among reeds or rushes. Several species afford an excellent though now much-neglected article of food, and were not only prized as such in England in the olden time, but were objects of still higher interest and regard, as affording the finest display of strength and intrepidity in the practice of the noble art of falconry. Birds of this genus occur in almost every quarter of the known world. The species which inhabit high northern latitudes, such as Kamtschatka and the shores of Hudson's Bay, migrate southwards before the arrival of winter. Such as breed in warm or temperate climates are more stationary.

Our common or long-necked heron (*Ardea major et cinerea*, Linn.) affords a familiar example of the genus. "Yon Cassius hath a lean and hungry look," yet when examined close at hand he is an elegant and beautifully plumaged species. The heron usually builds on the tops of lofty and umbrageous trees, yet in an island of Loch Conn we have seen its nest on *pollards* not more than ten feet high; and we lately noticed a large heronry among the precipitous cliffs which overhang the sea about a mile outside the entrance to the Cromarty Frith, upon the northern shore. We have several other British herons, the majority of which, however, must be regarded rather as stragglers or accidental visitors, than as truly indigenous species. The egrets are beautiful crested herons, with the plumage usually pure white, and in part decomposed, or very loose and flowing. Of these, the little egret (*Ardea garzetta*, Linn.) is common in Turkey, and the east of Europe, as well as in many parts of Asia, Africa, and the islands of the Mediterranean. It is frequently alluded to in the ancient household books of England; and in the recorded bill of fare of the famous feast of Archbishop Neville, in the reign of Henry IV., a thousand are said to have been served up at a single entertainment. It is indeed extraordinary that a bird now so rare in all the western countries of Europe, should have been at any time so superabundant in Britain; and Dr Fleming has judiciously suggested that the lapwing, which is so beautifully crested, may have been indicated under the old title of *egritte*. The true egret is not even alluded to as an indigenous bird so far back as the time of Willughby and Ray. The great egret (*Ardea egretta*, Temm.) is well known in Poland and Hungary, but scarcely ever shows itself in the western parts of the European continent.

The bitterns have the plumage of the neck extremely full and elongated. Their colours are usually brownish yellow, radiated or spotted with black. They form the modern genus *BOTAURUS*. The night-herons constitute another generic group, under the title of *NYCTICORAX*. The term, which signifies night-raven, has been no doubt applied from the circumstance of their feeding at night, and remaining in a state of comparative rest and inactivity throughout the day. The European species (*Ardea nycticorax*, Linn.,—*Nyc. Europeus*, Stephens) is more common in America than in the old world. New Holland and Africa each possesses a species. In form, Sir William Jardine observes, these birds are intermediate to the bitterns and true herons; the bill is short, and stronger in proportion than in either, and the hind head is adorned with (generally three) narrow feathers in the form of a crest. They feed by twilight, or in clear nights, and take their prey by wary watching, like the herons. They are gregarious and build on trees, and are noisy and restless during the period of incubation. The prevailing colours are ash-gray and black, or pale fawn and chesnut. The young are always of a dingier hue than their parents, and have their feathers marked with whitish spots.

The remaining genera of the *Cultrirostris* form Cuvier's third group.

In the genus *CICONIA*, Cuv., the bill is large, without nasal groove or furrow, the nostrils pierced near the base, and towards the dorsal portion. The tarsi are reticulated, and the anterior toes strongly palmated, especially the external. The mandibles are broad and light, and when struck together produce a frequent and peculiar snapping sound, almost the only one they ever utter. The best-known European species is the white or common stork (*Ciconia alba*), a bird somewhat smaller than the crane, but larger than the heron. The bill and legs are red, the whole plumage pure white, except the greater coverts, scapulars, and quill-feathers, which are black. It is a common summer bird in several European countries, especially Holland, where it is esteemed and protected, and has become so familiar as to build on the tops of houses even in the centre of large towns. Its periodical migrations have long excited the admiration of naturalists by their extent and regularity. They are indeed beautifully and wisely directed. "Yea, the stork in the heavens knoweth her appointed times; and the turtle, and the crane, and the swallow, observe the time of their coming." The species appears to have been regarded with peculiar favour in almost all ages and countries. By the ancient Egyptians it was looked upon with a reverence only inferior to that which they paid to the mystical ibis; the same feeling still preponderates in many parts of Africa and the East; while nearer home the Dutch are remarkable for their affectionate attachment to this "household bird." On the other hand, the stork itself appears to reciprocate this friendly feeling. Undismayed by the presence of man, it builds its capacious nest upon the house-top, or on the summits of "ancestral trees" in the immediate vicinity of human dwellings, or even envired by the busiest haunts of men. "It stalks," says Mr Bennet, "perfectly at ease along the busy streets of the most crowded town, and seeks its food on the banks of rivers, or in fens in close vicinity to his abode. In numerous parts of Holland its nest, built on the chimney top, remains undisturbed for many succeeding years, and the owners constantly return with unerring sagacity to the well-known spot. The joy which they manifest in again taking possession of their deserted dwelling, and the attachment which they testify towards their benevolent hosts, are familiar in the mouths of every one. Their affection for their young is one of the most remarkable traits in their character. It is almost superfluous to repeat the history of the female which, at the conflagration of Delft, after repeated and unsuccessful attempts to carry off her young, chose rather to perish with them in the general ruin than to leave them to their fate; and there are many other and well-authenticated proofs of a similar disposition. They generally lay from two to four eggs, of a dingy yellowish white, rather longer than those of the goose, but not so broad. The incubation lasts for a month, the male sharing in the task during the absence of the female in search of food."¹

Of the foreign species, the gigantic stork (*C. argala*) is well known in India by the name of adjutant. It measures upwards of six feet in height. A nearly allied species is the marabou of Africa (*C. marabou*, Temm.), very common in many parts of the interior. According to Major Denham, it is protected by the inhabitants on account of its services as a scavenger. Its appetite is most voracious, and nothing comes amiss to its omnivorous propensities. Mr Smeathman has given a long account of a bird of this kind which regularly attended at the dining table, and frequently helped itself to what it liked best. It one day darted its enormous bill into a boiled fowl, which it

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¹ *Zoological Gardens*, ii. 21.

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swallowed so instantaneously that all hope of rescue was in vain. On another occasion it actually bolted a cat.

The genus *MYCTERIA*, Linn., contains the birds called *jabirus*. They scarcely differ from the storks, except in the bill exhibiting a slight curvature upwards. The species, if correctly referred to by naturalists, though few in number, inhabit widely distant regions,—*M. Americana* being native to Cayenne, *M. Australis* to New Holland, and *M. Senegalensis* to Western Africa. Is the latter synonymous with Dr Ruppell's saddle-billed stork, *C. ephippiorhyncha*?

The genus *SCOPUS* is composed of a single species, *S. umbretta*, Linn., an African bird, of the manners of which we are still entirely ignorant. In English books it is called the tufted umber. Its generic title (*Σκοπος*) is Greek for sentinel. It is probably watchful and solitary.

The genus *ANASTOMUS*, of which the Pondicherry and Coromandel herons of Latham serve as examples, is peculiar to the East Indies. These species present a remarkable peculiarity in the structure of the bill. The mandibles touch each other only at their points and bases, thus leaving a gaping intervening space. *An. Coromandelianus* is common on the banks of the Ganges, and other eastern rivers, and likewise frequents the Coromandel coast during the months of September, October, and November, feeding on fish and reptiles. A more recently discovered species is *An. lamelligerus* of Temm. (*Pl. Col.* 236), a native of the Cape.

The genus *DROMAS* of Paykull has the bill compressed and swollen at the base beneath, with the commissures close. The only known species is *D. ardeola*, Temm. *Pl. Col.* 362, an African bird, with white plumage, the back and pinions, as well as the legs and bill, being black. It is of rare occurrence, but rather extended distribution, specimens having been obtained both from the shores of the Red Sea and the Senegal coast. "L'ardeole," says M. Lesson, "tient des œdicnèmes par son bec, et mêmes des sternes, de l'avocette, par son plumage et les tarses. C'est un véritable oiseau de transition dans l'établissement des familles."¹ Some recent writers regard this bird as identical with the *corrira* so long ago described by Aldrovandi² as an Italian species, but not since seen either in Europe or elsewhere. The descriptions however do not accord. Bechstein, Vieillot, and others, think the Italian *corrira* a fictitious species, made up from the body of an avocet and the legs of a thick-knee'd plover; but Professor Ranzani is of opinion, that as its name is a vernacular one, and there is no proof that Aldrovandi possessed any stuffed birds (none being mentioned in the catalogue of his museum, and the art in those days being almost unknown), a well-known living species must have been alluded to. Indeed it appears that Charleton, at least seventy years after the printing of the Italian author's third volume, received a specimen from Merret of what he considered as the bird in question.³ "Non vi ha al certo," observes Ranzani, "alcun giusto motivo di rinvocare in dubbio, che al tempo di Aldrovandi si trovasse ne' luoghi vallivi del territorio Bolognese un uccello steganopodo, il quali venisse da' cacciatori chiamato corrira, perchè correva velocemente." "E quantunque," he afterwards adds, "oggi di niuno de' molti cacciatori Bolognesi da me consultati conosca la corrira, non cesserò io per questo dal farne le più diligenti ricerche, potendo benissimo accadere, ch'essa torni alcuna volta a visitare i nostri terreni vallivi."⁴

In the genus *TANTALUS*, Linn., the bill, nostrils, and feet resemble those of the storks, but the back of the upper mandible is rounded, its point curved a little down-

wards, and slightly notched on either side. A portion of the head, and sometimes of the neck, is bare of feathers. The species, formerly confounded with the ibises, are of large size, and inhabit Asia, Africa, and America. The best known is *Tantalus loculator*, called the wood ibis in the United States. It is white, with the face and head greenish blue, the quill and tail feathers black, with coloured reflections. It measures above three feet in length, and the bill itself is about nine inches long, very broad at the base. The wood ibis is a solitary indolent bird, seldom associating in flocks, but resting alone, like a feathered hermit, listlessly on the topmost limb of some tall decayed cypress, with his neck drawn in upon his shoulders, and his enormous bill resting like a scythe upon his breast. Thus pensive and lonely, he has a grave and melancholy aspect, as if ruminating in the deepest thought; and in this sad posture of gluttonous inactivity (for in truth he has only over-eaten himself) he passes much of his time, till aroused by the cravings of hunger. He feeds on snakes, young alligators, fish, frogs, and other reptiles, and wisely migrates southwards on the approach of winter.⁵ In the United States the principal residence of this bird is in the inundated wilds of the peninsula of East Florida. The *Tantalus ibis* of Linn. is an African species, long erroneously regarded as the bird so highly venerated by the Egyptians; but it scarcely occurs in the country of the pyramids, being usually imported from Senegal. The other species of this genus are *T. leucocephalus*, from Ceylon and Bengal; and *T. lactea* (Temm. *Pl. Col.* 352), from Java.

The last genus we shall mention of our present tribe is *PLATALEA*, Linn., containing the birds called spoon-bills, which, like the preceding, are also few in number. The chief character is constituted by the rounded flat enlargement or dilatation at the extremity of the bill, from which they derive their English name. They inhabit marshy and muddy places, where they grope about with their spoons in search of worms and mollusca. They are gregarious and migratory, build on trees, occasionally among rushes, and occur in Europe (*Pl. leucorodia*), Africa (*Pl. nudifrons*), and America (*Pl. ajaja*). The last-named species, called the roseate spoon-bill, is a beautiful bird; the ground-colour white, but richly tinged with rose-colour, deepening in part into carmine-red. The feet are half webbed, and the toes are very long (see Plate CCCC. fig. 2). This bird is more maritime in its habits than the European kind, and wades about the coast in quest of shell-fish and small crabs. According to Captain Henderson (in his account of Honduras), it occasionally both swims and dives. Although it now and then straggles up the Mississippi towards Natchez, into Alabama, and even as far north as the banks of the Delaware, it is a truly tropical bird, frequent in Jamaica and other islands of the West Indies, as well as in Mexico, Guiana, and Brazil. In a southerly direction, it is said to spread as far as Patagonia.

TRIBE 4TH.—LONGIROSTRES.

In this tribe the bill may be characterized as lengthened and feeble. The species belong chiefly to the old genera *Scolopax* and *Tringa* of Linn. They bear a general resemblance in their forms and habits, and frequent moist places, where their slender bills can probe for worms and insects, without the risk of fracture.

In the genus *IBIS*, Cuv., the bill is long, arched, broad, and squarish at the base, with the point depressed, obtuse, rounded, and the upper mandible deeply furrowed throughout its whole length. The nostrils are narrow and oblong,

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¹ *Traité d'Ornithologie*, p. 531.

² *Ornithologia*, t. iii. p. 288.

³ *Exercitationes de differentiis Animalium*, Oxonii, 1677, p. 102-3.

⁴ *Elementi di Zoologia*, t. iii. parte ix. p. 300-2.

⁵ Nuttall's *Manual*, vol. ii. p. 83.

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and pierced through the membrane of the furrow near its base. The forehead and lores are bare of feathers.

The species of this remarkable genus are distributed over the warmer zones of all the four quarters of the globe, the green or glossy ibis (*Ibis falcinellus*), being itself found in Europe, Asia, Africa, and America, and occasionally in Great Britain. The sacred or Egyptian ibis (*Ibis religiosa*, Cuv.,—*Tantalus Ethiopicus*, Latham) is a bird of a more striking and peculiar aspect, though undistinguished by much diversity in the colours of its plumage. It measures about two feet six inches in length. The head and neck are, in the adults, bare of feathers, presenting nothing but a dark cutaneous surface. The prevailing colour is white, with long funereal-looking plumes of a purplish black colour, proceeding from beneath the tertiary wing-feathers, and hanging down not ungracefully on either side. The legs and feet are deep lead-colour. Among the ancient Egyptians, a people prone to award divine honours to the brute creation, the ibis was regarded as an object of superstitious worship, and its sculptured outline frequently occurs among the hieroglyphical images which adorn the walls of their temples. The conservation of its mystical body occupied the assiduous care of their holiest priests while living, and exercised the gloomy art of their most skilful embalmers when dead. To slay or insult it would have been deemed a crime of the darkest hue, and sufficient to call down upon the offender the immediate vengeance of heaven. The incarnation of their gods was effected through the medium of this sacred bird, and the tutelary deity of Egypt was supposed to be thus imaged to the eyes of adoring mortals when he descended from the highest heavens. The embalmed bodies of this species are still found in the catacombs, and other places of ancient sepulture; and the antiquary and the naturalist marvel alike at the wonderful art which, for some thousand years, has handed down unimpaired to a far-removed posterity the form and features of so frail a creature. The perfection of an unknown process has almost defied the ravages of time, and through its intervention the self-same individuals exist in a tangible form, which wandered along the banks of the mysterious Nile in the earliest ages of the world, or "in dim seclusion veiled," inhabited the sanctuary of temples, which though themselves of most magnificent proportions, are now scarcely discernible amid the desert dust of an unpeopled wilderness.

The natural and mythological histories of this remarkable bird are so closely combined by ancient authors, that it is scarcely possible to gather from their statements any rational meaning. Those, indeed, whose province it is to illustrate the history of mankind, by explaining the rise and progress of superstition, and the frequent connection between certain forms of a delusive worship, and the physical conditions of clime and country, may find in the distorted history of Egyptian animals an ample field for the exercise of such ingenious speculations; but the Zoologist has to do rather with things as they are, than as they were supposed to be,—and his province is to explain (or attempt so to do) the works of the God of nature as they exist in their most beautiful and harmonious simplicity, undeformed by the multitudinous fables of a remote antiquity. We need not, then, to inquire whether the basilisk be born from an egg produced in the body of the ibis, by a concentration of all the poison of all the serpents which it may have swallowed in the course of a long and reptile-eating life;—nor whether the casual touch of its lightest plume still suffices not only to enchant and render motionless the largest crocodile, but even to deprive it at once of life;—nor whether the ibis itself, according

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to an expression of the priest of Hermopolis, sometimes attains to so great an age that "it cannot die," unless when, removed from the sustaining soil of its beloved Egypt, it sinks beneath the *nostalgia* of a foreign land! For we know that the basilisk does not exist; that young ibises have been seen flapping themselves across the outstretched bodies of sleeping crocodiles, which afterwards sought the waters of the Nile with their accustomed alacrity; and that the age of the sacred bird, though from the skill of the embalmers it may be said to be "in death immortal," does not exceed that of the rest of its congeners.

The sacred ibis is usually observed either in pairs, or in small groups of eight or ten together. They build their nests on palms and other elevated trees, and lay two or three whitish eggs. They do not breed in Egypt, but arrive in that country when the waters of the Nile begin to swell. This apparent connection (as of cause and effect) between the presence of these birds and the fertilizing flow of the mighty and mysterious river, probably gave rise to their worship as divine agents in immediate connection with those grander processes of nature by which the surface of the earth was regulated, and sustained in a fit condition for the health and prosperity of the human race. A slight knowledge of natural history would indeed have sufficed to show, that such divine honours had not been awarded as a consequence of their destruction of serpents and other venomous reptiles; for the modern Egyptians confirm the views of Colonel Grobert, that the ibis does not prey on serpents at all, but feeds very much after the manner of the curlew, on insects, worms, small fishes, and molluscous animals.¹

A smaller sized though much more splendidly attired species, is the scarlet ibis (*I. ruber*) of America. This brilliant bird is confined to the new world, where it is chiefly tropical, abounding in the West Indies and the Bahama Islands, and stretching southwards of the equator at least as far as Brazil. In the course of the summer (generally in July and August) it migrates into Florida, Alabama, Georgia, and South Carolina, retiring into Mexico and the Carribbean Islands on the approach of the winter season. It is gregarious, feeding along the sea-coast, the shores of estuaries, and the banks of rivers, on small fry, shell-fish, insects, and worms. Although they often perch on trees (where the contrast of their fiery plumage with the surrounding foliage is said to produce a most resplendent effect), they build their nests upon the ground. The young for several seasons exhibit obscure shades of brown, they afterwards become spotted with red, and then assume the splendid attire of the parents, which is a uniform and dazzling scarlet, with the exception of the extremities of the first four primaries, which are of a rich bluish black. Pennant says that the scarlet ibis has been domesticated in Guiana; and Dr Latham possessed one which was brought alive to England, and lived for some time with his poultry. It is clear from the statements of American writers, that it is, at least in temperate countries, a bird of passage, although Cuvier observes, "que cette espèce ne voyage point." When taken young it is easily tamed, and submits to domestication without repining. Delaet says it has even propagated in captivity; and M. Delaborde has given the history of an individual which he kept for above two years, feeding it on bread, raw or cooked meat, and fish. It was fond of hunting in the ground for worms, and was in use to follow the gardener in expectation of that favourite food. It roosted at night upon the highest perch in the poultry-house, and flew out at an early hour of the morning, sometimes to a great distance from home. Our climate is probably too cold and variable for a bird which

¹ Wilson's *Illustrations of Zoology*, vol. i. pl. xix.

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on the approach of winter always migrates southwards, otherwise it would assuredly form a splendid (it is even said a savoury) addition to our stock of domestic fowls.¹

In the genus *NUMENIUS*, Cuv., the bill is arched, as in the preceding, but still more slender, and rounded throughout its entire length, instead of being square at the base. The extremity of the upper mandible extends beyond the under one, and projects a little over it at the base. There is an obvious palmation at the root of the toes.

To this genus belong the curlews,—well-known birds, of shy and wary habits, which, according to the season, haunt either the hilly pastures or the sandy shores. The North American species (*N. longirostris*, Wilson) is remarkable for the extraordinary length of its bill. (See Plate CCCC. fig. 3.) The common curlew of Britain (*N. arquata*) seems to inhabit exclusively, during the breeding season, our upland moors and pastures, and descends to the sea-coasts in winter. The smaller British species, called whimbrel (*N. phaeopus*), seems scarcely known in England during summer, but is then frequent in the north of Scotland, where it breeds. It is distinct from any of the American curlews,—with one of which, however, it has sometimes been confounded. A nearly allied species, first described by M. Vieillot under the title of *Numenius tenuirostris*, as a native of Egypt, has been ascertained by C. L. Bonaparte to exist in great numbers along the banks of the Tiber, where it occurs during winter. It has also been discovered by Signor Savi in the neighbourhood of Pisa, by Dr Pajola in the Venetian territory, and by Professor Bonelli in Piedmont. We doubt not it occurs occasionally in most parts of Europe (especially the eastern countries), although it escapes detection in consequence of its strong resemblance to the common whimbrel. Its distinctive phrase is—*Numenius pileo cicerino e nigro maculato: pennis longioribus ilium candidis, immaculatis*.² The small esquimaux curlew (*N. borealis*, Lath. and Richardson) passes over a vast extent of territory in its migrations,—breeding in the barren lands within the arctic circle, and spending the winter in Brazil.

In the genus *SCOLOPAX*, Cuv., containing the snipes and woodcocks, the bill is very long, but straight, and pervaded almost throughout its entire length by a nasal furrow. The upper mandible is slightly inflated at the tip, which is rather soft, and extremely delicate in its perceptions. The feet are not palmated. The head is compressed, the eyes large, and situate far back upon the head,—“*ce qui*,” says Cuvier, “leur donne un air singulièrement stupide, qu’ils ne démentent point par leurs mœurs.” Now, though the birds in question may want those accommodating instincts which elevate the character of many other species almost into a semblance of reason, we are not aware that they are in any way of defective intellect, that is, that their proceedings are at all discordant with self-preservation, the enjoyment of their natural propensities, or the continuance of their kind; and as to the position of the eye, whatever may be its physiognomical effect, is it not admirably adapted to their general modes of life, and their particular habit of plunging their bills into the mud of marshes, enabling them so to do, and yet to keep a sharp look-out around them? Depend upon it, their eyes are in the right place, and their large size cannot be otherwise than advantageous to birds which feed by night.

We have five British species of *Scolopax*, of which the woodcock (*S. rusticola*) is the chief, a bird much admired by epicures, who eat him, entrails and all,—a dirty practice, we opine: but, *de gustibus non disputandum est*. During

the day this species usually frequents the closest brakes, where the ground, from depth of shade, is nearly free from herbage. They abound most in thickets by the sides of open glades, or where roads intersect; for by these they pass to and from their feeding ground at evening and the dawn of morn. “Unless disturbed,” says Mr Selby, “they remain quietly at roost upon the ground during the whole day; but as soon as the sun is wholly below the horizon, they are in full activity, and taking flight nearly at the same instant, leave the woods and cover for the adjoining meadows or open land, over which they disperse themselves, and are fully engaged in search of food during the whole night. Advantage has long been taken of this regular mode of going to and returning from the feeding grounds by the fowler, in those districts where woodcocks are abundant, by suspending nets across the glades, or by the sides of hedges, where they are observed to pass continually; and though the adoption of the fowling-piece has in general superseded the modes of capture formerly practised, great numbers are still taken in this manner in Devonshire and Cornwall. Another method of entrapping woodcocks (as well as snipes) is by the springe, which is set in places where those perforations made by the bill of the woodcock in search of food, and technically called *borings*, are observed to be most frequent. It is formed of an elastic stick, of which one end is thrust into the ground, the other having affixed to it a noose made of horse-hair; the stick being then bent down, this noose is passed through a hole in a peg fastened to the ground, and is kept properly expanded by means of a fine trigger, so set as to be displaced by the slight pressure of the bird’s foot. To conduct them to this trap, a low fence of twigs, or of stones placed so closely together as to leave no passage through the interstices, is extended to some distance on each side of the springe, and generally in an oblique direction; over which obstacle, however trifling, it seems the birds never attempt to hop or fly, but keep moving along it, till they approach the part occupied by the noose of the springe: upon attempting to pass through this apparently open space, they displace the trigger, and are almost invariably caught by the noose, and retained by the spring of the stick against the opposing peg. Day being the woodcock’s time for repose, it sits very close, and is not easily flushed; the sportsman then requiring the aid of the busy spaniel, or the bush in which it is ensconced to be actually beaten by an attendant, before it will take wing. It rises, however, with much quickness, and threads its way through the branches with great rapidity, until the underwood and trees are fairly cleared, when its flight becomes measured, and offers an easy aim to the sportsman. When roused, it seldom flies to any great distance, but alights in the first thicket that attracts its attention, closing its wings, and dropping suddenly down, and in such cases it is not unusual for it to run a little way before it squats. Just before rising, upon being disturbed, or when running, it jerks its tail upwards, partly expanding it, and fully showing the white that distinguishes the under surface of the tips of the tail-feathers. In feeding, the woodcock inserts its bill deep into the earth in search of worms, which are its favourite and principal food. This instrument is most admirably calculated for the offices it has to perform when thus immersed in the soil; for, in addition to its great length, it possesses a nervous apparatus distributed over a great portion of its surface, and especially on such parts as are likely to come first into contact with its prey, giving it

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¹ *Gardens and Menagerie of the Zoological Society*. We do not know how it has happened that the wood-cut of the scarlet ibis in the work just referred to is copied into Mr Nuttall’s excellent *Manual of American Ornithology*, under the name of wood ibis, *Tantalus holulator*,—a bird which belongs to a different genus.

² *Ornitologia Toscana*, tom. ii. p. 324.

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Our other species of this genus are the common snipe, *S. gallinago*, Linn., which also occurs in the temperate parts of Asia; and the jack-snipe, *S. gallinula*, a winter visitant, which breeds, though sparingly, in the north of Scotland. Besides these, we have as occasional visitants,—the great or solitary snipe, *S. major*, Gmel., which haunts the vast marshes of the north of Europe,—and a species of which only one or two examples have been as yet discovered (it was first shot in Queen's county, Ireland, we believe in 1822), named *S. Sabini*, by Mr Vigors.² Although some of these birds have an extended geographical distribution, the great similarity of several species, both in size and plumage, has caused misapprehension. There is now no doubt that the species of Europe and America are quite distinct. The lesser woodcock, *S. minor*, is a beautiful bird, well known in the United States. The brown snipe of Pennant (*S. grisea*, Gmel.) forms the genus *MACROAMPHUS*, Leach. Its toes are webbed at the base.

The genus *RHYNCHÆA*, Cuv., has the bill very similar to that of the snipes and woodcocks, but it is slightly arched towards the tip, and wants the furrow on that part. The toes have no palmation. The species are more richly coloured than their congeners, and, in consequence of their occasional variation, have been as yet but indifferently distinguished. The Cape species so called (*R. capensis*,—*Scol. capensis*, Gm., Plate CCCC. fig. 4), occurs in Java and the East Indies; while *R. variegata*, by some regarded as its young, has been received both from China and the south of Africa. A very distinct species, however (*B. hilarea*), described by M. Valenciennes, has been discovered in South America.³

In the genus *LIMOSA* of Bechstein, the bill is still longer than among the woodcocks, straight, or even slightly turned upwards, and pervaded by lengthened grooves, although the terminal single groove is wanting. The tip is blunt and depressed. There is a palmation at the base of the outer toes. The general form of the species is more slender, and the legs longer, than in the immediately preceding groups. They haunt more habitually saline marshes and the sea shore.

We here place the birds called *godwits*, of which we have two British species,—the black-tailed godwit, *L. melanura*, Leisler and Temm. (*Scol. ægocephala*, Linn.), and the red godwit, *L. rufa*, Briss. (*Scol. Laponica*, Linn.). Of both of these birds the synonyms, till lately, were greatly confused, owing to the double moult to which they are sub-

ject, and which, producing a remarkable change in the nuptial plumage from that of autumn and winter, led to a corresponding multiplication of names,—each kind being described as two species, according to the season in which it was observed. Although the bill in the godwits possesses much of the general form of that of the woodcocks, it wants the extraordinary plexus of nerves, and therefore does not become rugose by exsiccation after death, but continues smooth and polished. It is also more solid, less flexible, and thicker towards the base. These birds inhabit marshes, and the banks and mouths of rivers, where the mud is soft and deep, and there they probe with their long extended bills in search of worms and insects. When thus engaged, they are frequently seen with their heads entirely under water; and we accordingly find them provided with that peculiar gland above the eye, of which the function appears to be to lubricate and defend that delicate and important organ from the irritating effect of saline waters.⁴ The females considerably exceed the males in size. Several fine godwits, distinct from those of Europe, occur in North America; and a semi-palmated species, with a strongly recurved bill (*Scol. terek*, Lath.), is found both in India and Van Diemen's Land, and seems in some of its characters to lead towards the avocets.

In the genus *TRINGA* of Temm., Selby, &c. (*Calidris* and *Pelidna*, Cuv.), the bill equals or is longer than the head, is straight or slightly arched, compressed at the base, the tip blunt, smooth, and dilated, semi-flexible, and furrowed throughout its length. The legs are of medium length, very slim, the feet four-toed, divided to the base, slightly margined, with the hind toe scarcely reaching to the ground.

The elegant and interesting species which compose this rather numerous genus are commonly known by the name of sea-larks or sandpipers, a term likewise bestowed upon the *Totani*. Many of them breed by the margins of lakes and rivers in the interior, although the majority congregate in autumn in numerous flocks along the sea coast. They moult twice a year, and their spring and summer plumage is generally very different from that of autumn and winter. This has occasioned great confusion in the history of several species. The sexes present no great disparity in point of plumage, but the females are of larger size. We coincide in Mr Selby's opinion, that the new genera *Calidris* and *Pelidna*, which Baron Cuvier has proposed in place of *Tringa*, are not so distinct or well defined as to warrant their adoption, being in fact only such slight modifications of form as might naturally be expected in birds placed at the extremes of the group to which they belong, and of which the intimate connection is shown by the intervention of species of intermediate form, leading gradually, almost imperceptibly, from one to the other. Besides, if these two generic groups are adopted, it would appear that *Tringa* would cease to exist as a recognised title, which is surely not in accordance with established rule. The species of our present genus are very widely distributed, and several are identical in Europe and America.

The dunlin or purre, *T. variabilis*, Temm. (*T. alpina* and *cinclus*, Linn.), is a strictly indigenous bird in Scotland, where it breeds both near the margins of our inland waters and along the sea-shore,—residing with us throughout the year. In America it penetrates during the summer season to the utmost habitable verge of the arctic circle, breeding on the desolate shores of Melville Peninsula. It likewise inhabits Greenland, Iceland, Scandinavia, and probably most of the coasts of Europe. We know that at least during winter it frequents the Italian shores. In the southern hemisphere it sometimes wanders as far as the Cape of

¹ *British Ornithology*, vol. ii. p. 110.

² *Linn. Trans.* vol. xiv. p. 556.

³ Ferrussac's *Bulletin des Sciences*, 2d cah.

⁴ Selby's *British Ornithology*, vol. ii. p. 94.

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Good Hope, and has been met with both in the West Indies and South America. When flying in great autumnal flocks, its aerial movements are extremely beautiful, each individual of the vast assemblage yielding so instantaneously to the same impulsion as to exhibit alternately the upper and the under surface of the body, so that we have for a time a living moving cloud of dusky brown, and then a brilliant flash of snowy whiteness.

The larger species, called the knot (*T. canutus*, Linn.), has also a vast range in a northerly direction. It passes the summer within the arctic circle, breeding in Melville Peninsula, and in Hudson's Bay, as far south as the fifty-fifth parallel. It lays four eggs of a dun colour, spotted with red, upon a tuft of withered grass. The knot winters in Britain, but many proceed much farther south, as we know they occur towards the end of autumn in the Venetian territory. The great mass of the North American knots pass over the United States, and spend the winter within the tropics. The other British species are *T. rufescens*, *Temminckii*, *minuta*, *maritima*, and *subarguata*.

The genus *ARENARIA*, Bechstein, closely resembles the sandpipers of the genus *Tringa*, but is distinguished by the entire absence of the hind toe. The only known species is the sanderling (*A. calidris*), one of our winter birds of passage, which breeds in the remotest northern regions, forming a rude grassy nest among the desolate marshes, and laying four dusky coloured eggs, spotted with black.

The genus *FALCINELLUS*, Cuv. (composed of *Scol. pygmaea*, Linn.), has the bill considerably arched, and the hind toe wanting. The only known species is an African bird, which occasionally makes its appearance in Europe. M. Temminck seems to think it should be regarded rather as a synonym than a distinct actual species.

The genus *MACHETES*, Cuv., bears a great resemblance to *Tringa*, except that there is an obvious palmation at the base of the toes. It contains only one species, commonly called the ruff (*T. pugnax*, Linn.), well known in the Lincolnshire fens and the London markets (see Plate CCCC. fig. 5). It is a summer bird of passage, arriving in the fenny districts of England in the month of April, and departing towards the end of September. The ruff, as its specific name implies, is a remarkably pugnacious species, a disposition which probably arises from its polygamous habits, in which it differs from its congeners. Some people say there are more males than females. Be this as it may, as soon as these birds arrive, each male fixes upon a small hillock or dry grassy spot among the marshes, where he keeps turning about till he has almost trodden it bare; but the moment a female makes her appearance, a general combat commences, the male birds lowering their heads, expanding their neck-feathers, and flying at each other with the action of fighting cocks. These battles are obstinate and long continued, and whoever proves the victor for the time obtains the female. They disperse at night for the sake of feeding, but every morning soon after daybreak each male returns to his hillock, where the same scenes of rivalry and love take place, and continue till their passionate fervour is abated, towards the end of June. The plumage of the ruff presents an almost infinite variety, scarcely two individuals being ever found precisely the same. The lengthened feathers of the head and neck are produced in spring, and shed towards the close of summer; and during autumn and winter the plumage becomes so different from that of the breeding season, that the birds would not be recognised as the same by any one previously ignorant of such mutation. Their flesh is high-

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ly esteemed as a delicate and nutritious food. Though these birds extend northwards as far as Iceland, and the colder parts of Russia, they never visit Scotland, the marsh of Prestwick Car, near Newcastle, appearing to be their British boundary. They occur, though rarely, in North America. Though their natural food is worms and water insects, they fatten soon in confinement on boiled wheat, or bread and milk mixed with bruised hempseed.

The genus *HETEROPODA* of Nuttall has the bill straight, rather enlarged and punctate at the extremity, the tarsus of moderate length, the three anterior toes connected at the base by a membrane. Example, *Tringa semipalmata*, Wilson. In the genus *HEMIPALMA*, Bonaparte, the bill is much larger than the head, partly arched, dilated, and studded at the tip with minute tubercles. The tarsus is very long, and the toes are usually connected by a membrane as far as the first articulation. The species are called stilt sandpipers, of which *H. himantopus* was discovered by C. L. Bonaparte and Mr Cooper. Both these genera are American.

In the singular genus *EURINORHYNCHUS*, Wilson, the bill is short, thin, depressed, spoon-shaped, the tarsi short, slender, reticulated. The only known species is a very rare and remarkable bird, *E. griseus*, native, it is supposed, both to Europe and America.¹ It was formerly classed with the spoon-bills (*Platalea pygmaea*, Linn.), though scarcely larger than a sparrow. There is a specimen in the French Museum, which was accidentally killed near Paris. The plumage is gray above, white beneath.

In the genus *PHALAROPUS* of Brisson, the bill, though more flattened, resembles that of *Tringa*, but the toes are margined by a broadish membrane. In their habits the species are more aquatic than most of their congeners; for though they cannot dive, they float buoyantly on the surface, or even make their way by swimming with almost the ease of the regularly web-footed birds. The gray phalarope or scallop-toed sandpiper (*Phal. lobatus*, Flem.) is found occasionally in Britain during winter. It breeds habitually within the arctic circle, in Hudson's Bay, among the North Georgian Islands, and along the sterile shores of Melville Peninsula. According to Mr Bullock, it is not uncommon in the marshes of Sunda and Westra, the most northerly of the Orkney Isles. When seen swimming in pools, it is continually dipping its bill into the water, as if feeding on some minute aquatic creature. The plumage varies greatly with the season, and a variety of names have been bestowed in consequence of these mutations. The red phalarope (*Tringa fulicaria*, Linn.) represents the summer plumage. It was seen by our northern navigators on the 10th of June, in latitude 68°, swimming at its ease though several miles from land, but surrounded by mountains of ice.

In the genus *STREPSILAS*, Illiger, the legs are rather low, the bill short, and the toes without palmation as in *Tringa*, but the bill is conical and pointed, with the nasal fissure extending only one half its length. The hind toe nearly touches the ground. The only known species, *St. interpres* (of which *St. morinellus* is the young) is a winter bird of passage on the mainland of Britain, though it breeds and remains throughout the year among the Shetland Isles. The turnstone, as it is vernacularly called, is one of the most generally distributed of birds, being found at some season or other in almost every region of the globe. The English name is derived from its habit of turning over little stones along the shore in search of food, which it is enabled to do by its bill being proportionally stronger and stiffer than that of its congeners.

¹ Acad. Suec. 1816, pl. vi.

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In the genus *TOTANUS*, Cuv., the bill is slender, round, pointed, firm, the upper mandible slightly arched, with the nasal groove not extending above half its length. The form is light and active, the legs rather long, the toes webbed at the base, more especially between the outer and middle toe. In birds of this genus, as Mr Selby has observed, the comparatively hard and sharp-pointed bill indicates a corresponding change in habits and economy; so that instead of seeking their food by probing in the sand or softer mud, they search for it along the pebbly banks of lakes and rivers, or the ocean's gravelly shore. Some reside habitually in inland districts, while others prefer the sea-coast, or migrate thither during the autumnal season. The British species are the dusky sandpiper, *T. fuscus*, Leisler; the redshank, *T. calidris*, Bechst.; the green sandpiper, *T. ochropus*, Temm.; the wood sandpiper, *T. glareola*, Temm.; the common sandpiper, *T. hypoleucos*, Temm.; and the greenshank, *T. glottis*, Bechst. Besides which, the spotted sandpiper, *T. macularia* (a very common species in North America), &c. are of occasional occurrence. Regarding the last-named species, Mr Bartram informed Alexander Wilson, that he saw one of these birds defend her young for a considerable time from the repeated attacks of a ground squirrel. The scene of action was on the river shore. The parent had thrown herself, with her two young behind her, between them and the land; and at every attempt of the squirrel to seize them by a circuitous sweep, she raised both her wings in an almost perpendicular position, assuming the most alarming aspect possible, and rushing forwards on the squirrel, which for a time drew back intimidated; but soon returning, was met as before by the affectionate but infuriated bird, her wings and whole plumage bristling up to twice their natural size. This interesting, but, for one of the parties, fearful play, continued for about ten minutes, when the strength of the bird began to flag, and the attacks of the quadruped became more audacious, on which Mr Bartram interfered, "like one of those celestial agents," says Wilson, "who in Homer's time so often decided the palm of victory"! The green-shank (*T. glottis*), though usually regarded as merely a passenger in spring and autumn, is now known to breed in Scotland. It inhabits the northern parts of both continents, but is rarer in the new world than the old. Mr Audubon traced it as far south as the Tortugas, near the extremity of East Florida, and Latham received it from Jamaica. It also occurs in Bengal. Our common red-shank (*T. calidris*) is found occasionally in North America. A large species well known in the western world by the name of *willet*, and characterized by all the anterior toes being conspicuously webbed at the base, forms M. Bonaparte's genus *CATOPTROPHORUS*. This bird not only wades, but swims. It is the semi-palmated snipe (*Scol. semi-palmatas*) of the older systems.

The genus *LOBIPES* of Cuvier combines the bill of the preceding genus (*Totanus*) with the lobated toes of *Phalaropus*. We may mention as an example the red-necked phalarope,—*Tringa hyperborea*, Linn. (*Lob. hyperborea*, Cuv.), a species not uncommon among our northern islands, where it swims with great ease,—resembling when in the water a beautiful miniature representation of a duck. It likewise breeds all along the forlorn shores of arctic America, resorting to Hudson's Bay in autumn. Another species (*L. Wilsonii*) seems confined to the new world, where it breeds on the banks of the Saskatchewan, and occurs at least as far south as Mexico. It does not advance to so high a northern latitude as the hyperborean species, being as yet unknown beyond the fifty-fifth parallel. It forms an artless nest within the shelter of some grassy tuft, laying two or three pear-shaped eggs, of a tint between yellowish gray and cream colour, interspersed with small roundish spots, and a few larger blotches of umber-brown

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towards the obtuser end. It can only be regarded as a straggler in the United States. This bird forms the sub-genus *HOLOPODIUS* of Bonaparte, the basal web between the inner and middle toe being less than in the preceding species. The synonyms of both are still somewhat confused.

The genus *HIMANTOPUS*, Brisson, has the bill round, slender, pointed, the nasal furrow extending only half its length. But the principal and most peculiar character consists in the enormous length of the leg and tarsus, from which the species have derived the title of stilts, or long-legged plovers. The toes are united by a basal web, larger on the outer than the inner portion of the foot. These birds have a greater predilection for the borders of the sea, and for brackish lakes, than for the banks of rivers or pure fresh-water lakes. Their movements are rapid on the wing, but their gait is somewhat staggering, from the disproportionate length of their legs. The kind which occurs in Europe (*Him. melanopterus*, Meyer), called the black-winged stilt, has been known to breed in France, and accidentally visits England, but its chief resorts are the great salt marshes of Hungary and Russia. It is often seen in Italy in little flocks in spring, travelling northwards. It likewise occurs in Asia, Africa, and America; but the species of the new world, described by Wilson, is the *Him. nigricollis* of Vieillot. We shall here quote his account of its manners and mode of nidification, as the history of the European stilt, in these particulars, is scarcely known. "This species arrives on the sea-coast of New Jersey about the 25th of April, in small detached flocks of twenty or thirty together. These sometimes again subdivide into lesser parties; but it rarely happens that a pair is found solitary, as during the breeding season they usually associate in small companies. On their first arrival, and indeed during the whole of their residence, they inhabit those particular parts of the salt marshes pretty high up towards the land, that are broken into numerous shallow pools, but are not usually overflowed by the tides during the summer. These pools or ponds are generally so shallow that with their long legs the avocets can easily wade them in every direction; and as they abound in minute shell-fish, and multitudes of aquatic insects and their larvæ, besides the eggs and spawn of others deposited in the soft mud below, these birds find here an abundant supply of food, and are almost continually seen wading about in such places, often up to the breast in water.

"In the vicinity of these bald places, as they are called, fifty yards off, among the thick tufts of grass, one of these small associations, consisting perhaps of six or eight pair, takes up its residence during the breeding season. About the first week in May they begin to construct their nests, which are at first slightly formed of a small quantity of old grass, scarcely sufficient to keep the eggs from the wet marsh. As they lay and sit, however, either dreading the rise of the tides, or from some other purpose, the nest is increased in height with dry twigs of a shrub very common in the marshes, roots of the salt grass, sea-weed, and various other substances, the whole weighing between two and three pounds. This habit of adding materials to the nest after the female begins sitting, is common to almost all other birds that breed in the marshes. The eggs are four in number, of a dark yellowish clay colour, thickly marked with large blotches of black. These nests are often placed within fifteen or twenty yards of each other; but the greatest harmony seems to prevail among the proprietors. While the females are sitting, the males are either wading through the ponds or roaming over the adjoining marshes; but should a person make his appearance, the whole collect together in the air, flying with their long legs extended behind them, keeping up a continual yelping note of *click, click, click*. Their flight is

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"This singular manœuvre is, no doubt, intended to induce a belief that they may be easily caught, and so turn the attention of the person from the pursuit of their nests and young to themselves. The red-necked avocet practises the very same deception, in the same ludicrous manner, and both alight indiscriminately on the ground or in the water. Both will occasionally swim for a few feet, when they chance in wading to lose their depth, as I have had several times an opportunity of observing."¹

The singular birds called avocets form the genus *RECURVIROSTRA*, Linn. Their feet are almost as fully palmed as those of certain *Natatores*, yet they are generally classed among the *Grallatores*, by reason of their lengthened tarsi, and legs bare above the knee. The bill also has the same lengthened, slender, pointed form, and smooth elastic structure, which characterize our present order, with which the birds in question agree in their general mode of life. The character which distinguishes them from all other birds is the extraordinary upward curvature of the bill (see Plate CCCC. fig. 6). The avocets live either in pairs or small companies in the midst of marshes, where they wade about with great ease, and to a considerable depth, in consequence of their bodies being raised so high above the surface. Though web-footed, they do not swim except by compulsion; yet one which Wilson wounded attempted repeatedly to dive, but the water was too shallow for his purpose. They run rapidly, and their flight is powerful and long sustained. Their nests are described as small cavities in the earth, lined with a few weeds, or merely the bosom of the bare sand; sometimes, however, they are raised several inches above the surface, as if to avoid the effects of moisture or inundation. The European species (*R. avocetta*, Linn.) is not uncommon along the eastern coasts of England south of the Humber. It breeds in the fenny parts of Lincolnshire and Norfolk, as well as in Romney Marsh in Kent. They assemble during winter in small flocks, frequenting the oozy shores about the mouths of rivers, where they scoop out small worms and mollusca. Buffon indulges in one of his characteristic vagaries while discussing the singular bill of this bird, which he supposes to be "one of those errors or essays of nature, which, if carried a little further, would destroy itself; for if the curvature of the bill were a degree increased, the bird could not procure any sort of food, and the organ destined for the support of life would infallibly occasion its destruction." This essay of nature is, however, as it happens, a most successful one; for by means of its lengthened legs and upturned bill, the avocet feeds with facility in muddy marshes, where if otherwise organized it would probably starve. If a devoted servant of God, while tonsorially engaged on some beautiful Sabbath morning, were to move the edge of his glittering blade an inch nearer his carotid artery, he would die, leaving behind him, in all probability, a disconsolate widow, and a large family of small children; but as he takes especial care to move his useful weapon in another direction, the artery remains intact, and the crime of suicide unaccomplished. We doubt not that the curvature of the bill in question could not have been better projected even by Buffon himself, although he was addicted in his youth to mathematics. The American avocet (*R.*

Americana, Linn., Plate CCCC. fig. 6) has the head and neck pale rufous, and the bill takes a downward curve towards the extremity. Though abundant on the banks of the Saskatchewan, as far as the fifty-third parallel, it does not seem to proceed into the more northern regions. Besides these species, there are the *R. alba* of Latham (*R. orientalis*, Cuv.), from India; and the *R. rubricollis*, Temm., a native of New Holland. Our indigenous species also occurs both in Asia and Africa.

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FAMILY V.—MACRODACTYLES.

The prevailing character of this group consists in the extremely long narrow form of the toes, which are without any connecting web. Nevertheless the species run with great ease in moist places, and some of them swim very swiftly. The bill, more or less compressed laterally, varies in length in different genera, but is never so delicately slender as among the preceding family. The body in these birds is much compressed, a form determined in a great measure by the narrow nature of the sternum. The wings are of medium length, or short; and the power of flight, though necessarily efficient in such as are birds of passage, is on the whole restricted, or but sparingly exercised. The posterior toe is of considerable length.

The first genus, called *PARRA* by Linnæus, contains the jacanas, by some named spur-winged water-hens. The bill is rather longer than the head, nearly straight, laterally compressed, and somewhat enlarged both above and below towards the extremity. There is usually a small fleshy shield upon the base of the forehead. The toes are of great length, very narrow, unwebbed, and the claws, especially the hinder one, very long and sharp (see Plate CCCC. fig. 7). The anterior angle of the wing is armed with a spur. The jacanas occur in the warmer countries of the world—in Bengal, Java, the Celebes, China, South America, and parts of Africa. They inhabit marshy places, and run with great facility over the surface of aquatic plants, their long, extended toes spreading over so much space as to prevent their sinking in the water. They feed on insects, build their nests among the moist herbage, and lay four or five greenish eggs spotted with brown. Their flight, though low, is rapid. They are shy and silent birds, except at night, when their voices are often heard among the marshes. The Chinese jacana of Latham (*Parra sinensis*, Gmelin) is found both along the marine shores and the moist plains of the interior. This species, as Mr Gould observes, is distinguished not more by grace and beauty of form, than by its admirable adaptation to the particular localities to which nature has allotted it. Formed for traversing the wide morass, or lotus-covered surface of water, it supports itself upon the floating weeds and leaves by its extraordinary extent of toes and unusual lightness of body. Like our common water-hen, of whose habits and manners it partakes largely, it is no doubt capable of swimming, although the long and pendent tail-feathers seem an inconvenient appendage for such a purpose. Its powers of flight appear deficient, the quill-feathers being terminated by a slender process proceeding from the tip of each shaft. This singular bird has been long known as a native of the low lands of India and other eastern countries, but was not till lately ascertained to occur in the Himalaya, where it inhabits lakes and swamps among the hills.² Another eastern species (*P. gallinacea*, Temm. Pl. Col. 464) is provided with a crest, but wants the spurs upon the wings.

In the genus *PALAMEDEA*, Linn., the bill is rather short, conical, compressed, convex, and curved at the extremity. There is a bare space around the eyes, the wings are am-

¹ *American Ornithology*, vol. iii. p. 76.

² *Century of Birds from the Himalaya Mountains*.

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ple, furnished with strong spurs. The tarsi are short and thick, the toes and claws long. Some systematic writers include in this genus only a single species, *P. cornuta*, Linn., called kamichi or the horned screamer, a South American bird, larger than a goose, with a slender moveable horny projection on the forehead. Though this bird affects inundated places, its toes are without palmation. In its general aspect, and several of its special habits, it exhibits an approach to the gallinaceous order; and although its stomach is but slightly muscular, it lives much on grain and herbage.¹ It is also easily reduced to the domestic state; and although it lays only two eggs, the young speedily follow the parents.

It is by no means easy to conjecture the natural uses of these formidable weapons on the wings of this and several other species. One would suppose them intended to wage war among their kind,—yet the birds so endowed are for the most part peaceable, and averse to broil and battle,—even in most instances of a timid and fearful nature; and in the case of several of the plover tribe, there is no appreciable difference in the habits of the armed and unarmed kinds. All who have studied the manners of the kamichis agree that they are the gentle inhabitants of moist savannahs, or the shores of those extensive rivers which intersect the southern portion of America, and that there is nothing pugnacious in their temper. Yet they are “doubly armed,” the margin of each wing bearing a pair of very large spurs, thick at the base, but tapering sharply to a point, and, no doubt, when driven forcibly forward by the muscular action of a powerful wing, capable of inflicting such a blow as would at once deprive most small animals of life.

Another bird, by some referred to our present genus, is *Pal. chavaria*, Temm. (*Pl. Col.* 219), the *Parra chavaria* of Linn., known in some English works as the faithful jacana. Instead of a horn, its head is ornamented by a feathered crest, and there is an obvious palmation between the outer and middle toes. For these and other reasons it forms the genus *CHAUNA* of Illiger. Its head and upper neck are clothed with down, the latter being surrounded by a black collar. The rest of the plumage is lead colour and blackish, with a white spot upon the front of the wings, and another on the base of the primaries. Linnæus, on the authority of Jacquin, gives the following history of this bird:—“It inhabits the rivers, lakes, and marshes, near the river Sinu, about thirty leagues from Carthage, in South America. It feeds on vegetables; its gait is solemn and slow, but it flies easily and swiftly; it cannot run unless assisted by the wings at the same time. When any part of the skin is touched by the hand, a crackling is felt, though it is very downy beneath the feathers; and this down adheres so closely as to enable the bird at times to swim, notwithstanding the length of its legs and of its cleft feet; which latter enable it also to walk on the aquatic plants of the pools. It has two strong and pointed spurs on the bend of the wing, which are, however, hidden when the latter is closed, but when expanded they become formidable weapons, aided by the strong and lengthened wing; and by means of them it is able to drive off birds as big as the carrion vulture, and even that bird itself. The natives, who keep poultry in great numbers, have one of these tame, which goes along with the flock about the neighbourhood to feed during the day, when this faithful shepherd defends them against birds of prey: it never deserts the charge committed to its care, although able to fly, but returns home with them safe in the evening. It is so tame as to suffer itself to be handled by a grown person, but will not permit children to attempt the same. Its voice is clear and loud, but far from agreeable.”²

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Baron Cuvier here places the genus *MEGAPODIUS*, Quoy et Gaim., of which the bill is slender, straight, flattened, and enlarged at the base, restricted at the centre, and inflated towards the point. The tail is small and wedge-shaped. The general form is massive, the plumage usually brown, without lustre. The species inhabit New Guinea, the Marianne Islands, &c. and are described in the voyages of Freycinet and Duperrey. They are remarkable for the largeness of their eggs. Some authors place them with the genera *Crax* and *Penelope*, rather than in the grallatorial order.

The extensive genus *RALLUS*, Linn., is in one or other of its forms known in almost every country of the world. With Bechstein, we would restrict the title to such as have the bill longer than the head, rather slender, compressed at the base, with the tip cylindrical, and slightly curved. As a British example may be mentioned our common water-rail (*R. aquaticus*), a shy and solitary bird, which resides throughout the year in Britain. It is extensively spread over Europe, but does not occur in America. The land-rails form the genus *CREX*, Bechstein, and have the bill shorter than the head, thick at the base, somewhat cultrate, and compressed. The wings are armed with a small concealed spine. Besides the well-known corn-crake (*C. pratensis*), a summer bird of passage, of which the deceptive note is heard so often during evening twilight, we have the spotted crake, *C. porzana*, Baillon's crake, *C. Baillonii* (Olivaceous gallinule of Mont.?), and the little crake, *C. pusilla*. The Carolina rail seems a *Crex* in the form of its bill, though its aquatic habits assimilate it to *Rallus*. It assembles during autumn in vast numbers on the reedy shores of the larger rivers in the middle and southern states of North America, and affords abundant occupation to sportsmen. Any active and expert marksman may kill ten or twelve dozen in a few hours. It winters to the south of the Union. The diet of the different species probably varies with time and place. The American bird just named is very fond of rice. Our own species feed both on grain and insects. Sir W. Jardine found a short-tailed field-mouse in the stomach of a land-rail. This bird is called king of the quails in some continental countries, in consequence of its arriving and departing with these birds.

The old genus *FULICA*, Linn., has, like the preceding, been also subdivided, in accordance with the form of the bill and lobation of the toes. For example, the genus *GALLINULA* of Briss. and Lath. has the bill resembling that of *Crex*, but there is a flat fleshy shield upon the forehead. The toes are long, and bordered by an extremely narrow lateral margin. We here place our British gallinule, familiarly known by the name of water-hen, *G. chloropus*, Lath. This bird, though with us a permanent resident, is migratory in all the more northern parts of Europe. It occurs both in Asia and Africa, but not in America, as some erroneously suppose. It swims and dives well, though its feet might, *a priori*, be deemed but little fit for such aquatic service. The water-hen is of rather familiar habits, that is, a pair are sure to make their appearance as soon as any small artificial piece of water has been formed, even in the closest proximity to human dwellings. It builds by the water-side, and lays a great number of eggs, from eight to ten, which it is said to cover carefully during its occasional absence in search of food. The purple and Florida gallinules (*G. Martinica* and *galeata*) occur in North America; and a Javanese species (*G. ardosiaca*) is described by M. Vieillot.

In the genus *PORPHYRIO* of Brisson, the bill is higher in relation to its length than in the preceding. The toes are extremely long, with scarcely a perceptible bor-

¹ Bajan, *Mém. sur Cayenne*, t. ii. p. 284.

² Shaw's *General Zoology*, vol. xii. p. 272.

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der; and the frontal disk, sometimes rounded, sometimes square above, is of considerable size. The species are remarkable for richness of colouring. *P. hyacinthinus*, Temm. (*Fulica porphyrio*, Linn.), is an African species, not unfrequent in Sicily and Sardinia.

The genus *FULICA*, as now restricted, is chiefly distinguished from its congeners by a scallop-shaped or broadly-festooned membrane on each side of the toes. It contains the coots, of which *F. atra*, Linn., our common coot, affords a good example. This bird, as generally distributed in Britain throughout the summer season as the water-hen, leaves the northern portions of the island on the approach of winter. It dislikes being approached in open water, though a good diver, and quickly betakes itself to some protecting cover of reeds or other water-plants on every slight alarm. The cinereous coot of the western world (*F. Americana*, Gmel.) is a distinct species, though not so regarded by Alexander Wilson. It is widely spread over a vast extent of territory, from the steaming marshes of Jamaica to the cool and grassy lakes which skirt the plains of the Saskatchewan.

Baron Cuvier terminates his systematic exposition of the grallatorial order by three genera of a somewhat anomalous nature, which certainly do not amalgamate either with their neighbours or each other.

The genus *CHIONIS* of Forster has the bill short, strong, compressed, the nostrils tubular, and protected by hard, elevated, and compressed folds, which envelope the base. (Plate CCCC. fig. 8.) The front of the head and part of the face are naked, the wings long, the feet short. There is only a single species known. It is called the sheath-bill, *Ch. Forsteri*, or *neorophaga*, or *vaginalis*, and is of snowy whiteness, and of the size of a pigeon. A great diversity of opinion exists regarding its position; some writers removing it into the ensuing order, while Mr Swainson places it among the Columbidae. It inhabits New Zealand, Kerguelen's Land, Staten Land, and other countries of the southern hemisphere, where it is said to frequent the seashore in flocks, feeding on mollusca and carrion, which latter renders its flesh offensive to the taste. It was discovered during Cook's circumnavigation.

The genus *GLAREOLA*, Gmel., contains the pratincoles, or sea-partridges as they are sometimes called. The bill is short, compressed, somewhat arched throughout, and rather deeply cleft. The wings are of great length, and very sharp pointed, somewhat resembling those of swallows. The legs are of medium length, and there is a slight palmation between the outer and middle toes. The tail is usually forked. These birds fly in numerous noisy flocks, and feed on insects, "particulièrement des mouches et autres insectes ailés qui vivent parmi les joncs et les roseaux; il se lance" (M. Temminck alludes particularly to the European species) "sur ces insectes avec une rapidité étonnante, et les saisit au vol ou à la course."¹ The pratincoles inhabit the temperate and warmer regions of the old world, and are unknown in America. The colored or Austrian species (*G. torquata*, Meyer) is common in the south-eastern countries of Europe, and has been killed occasionally in Britain.² *G. lactea*, Temm., inhabits Bengal;³ *G. grallaria* of the same author is native to New Holland.

Lastly, the genus *PHENICOPTERUS*, Linn., contains

those extraordinary birds called flamingoes. The bill is higher than wide, dentated, conical towards the point, the upper mandible suddenly bent from its centre downwards upon the under one, which is the broadest. The neck and legs are of extraordinary length, and the anterior toes are united by a broad palmation. Mr Swainson regards this genus as the grallatorial type of the *Anatidae*, and he consequently places it in the natatorial order, which we are just about to enter. The only species known in Europe is *Ph. ruber*, Linn., a bird well known in Sicily and Calabria, and very abundant in Sardinia, especially among the lagoons and marshes in the neighbourhood of Cagliari. Large flocks occur almost every year along the southern coasts of France, and a few sometimes stray as far northwards as the banks of the Rhine. It is common in many countries of Africa and Asia; but the American species, regarded as synonymous by Wilson, is a distinct kind, mentioned long ago as such by Molina. (See Plate CCCC. fig. 9.) It is the *Ph. Americanus* of Mr Nuttall, and the bird alluded to by Thomas Campbell in his *Gertrude of Wyoming* :—

Then, where of Indian hills the daylight takes
His leave, how might you the flamingo see
Disporting like a meteor on the lakes.

Another western kind occurs in South America (*Ph. ignipalliatu*s, Isid. Geoff.),⁴ while a fourth (*Ph. minor*) is native to the Cape and Senegal.⁵ These birds in general inhabit solitary sea-coasts in most of the warmer regions of the earth, where they associate in flocks, and migrate in bodies formed into an angular phalanx, like wild geese. They feed upon mollusca, insects, and spawn, which they fish up by means of their lengthened necks, sometimes turning their bill upside down, to take advantage of its peculiar, and apparently inconvenient form. They are said to be extremely shy and watchful (although Dampier and his two companions succeeded in killing fourteen at once⁶), and place sentinels, which on the approach of threatened danger, give alarm by a loud and trumpet-like cry. They also breed together in inundated marshes, raising their nests to a considerable height, by collecting the mud into a pyramidal hillock with their toes, after which they brood and hatch their eggs in what may be called a standing posture, their feet and legs being often in the water. The young are only two or three in number, and run almost as soon as excluded from the shell. They sleep standing upon one leg, with the neck folded back upon the body, and the head reclined beneath the wing. They run swiftly, but never swim from choice.⁷ The tongue of the European flamingo was much admired by ancient epicures; and Apicius, that "deepest abyss of wastefulness," as Pliny calls him, is supposed to have been the first to discover its exquisite flavour.⁸

ORDER VI.—PALMIPEDES, or WEB-FOOTED BIRDS.⁹

The birds of this order are especially characterized by their peculiar adaptation for swimming, their feet being generally short and placed far behind, their tarsi short and compressed, and their anterior toes connected by membranes,

¹ Manuel, ii. p. 502.

² Bullock, in Linn. Trans. xi. 177.

³ See *Planches Col.* 399;—also Leach in Linn. Trans. xiii. pl. 12.

⁴ *Annal. des Sciences Nat.* xvii. 454.

⁵ On concluding this portion of our present treatise, domestic circumstances, with which it does not concern the reader to become acquainted, but which the author could not control, rendered impossible the continuance of his own labour. The sketch of the ensuing (natatorial) order was therefore kindly undertaken by Mr Macgillivray, whose well-known acquirements in Ornithology will render the substitution advantageous to the public.

⁶ Temminck, *Pl. Col.* 419.

⁷ *Voyage*, i. 70.

⁸ Nuttall's *Manual*, ii. 70.

⁹ NATATOIRES, Illiger.

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or inlaid by lateral lobes. Their plumage is close, often glossy, and imbued with an oily fluid, which repels the water; and their skin is moreover covered with a dense layer of down, which prevents the rapid escape of the heat generated in their bodies. They are the only birds whose neck exceeds their legs in length, the reason of which arrangement is, that while swimming on the surface of the water they have often to search for their food at some depth. Their sternum is elongated so as to cover the greater part of the viscera, and has only a lateral notch, or oval foramen, so that a large surface is afforded for the insertion of the pectoral muscles. Their œsophagus is always wide, their gizzard generally muscular, and their intestine furnished with two rather long cæca. Their windpipe varies in form, but the inferior larynx is simple, although in one family it has a curious bony and cartilaginous dilatation.

This order has been divided into four families:

1. The *Brachypteræ*, or short-winged sea-birds, having the wings very short, and the feet placed so far behind that they are obliged to assume a nearly erect posture when on shore.

2. The *Longipennæ*, or long-winged sea birds, having the wings extremely long, the hind toe free or wanting, and the bill horny.

3. The *Totipalmæ*, of which the hind toe is connected with the rest by a common web, the wings long, and the bill horny.

4. The *Lamellirostres*, whose bill, which is thick and covered with a soft skin, has the edges furnished with transverse horny plates or teeth.¹

FAMILY I.—BRACHYPTERÆ, OR DIVERS.

The organization of these birds renders them more aquatic than those of any other family. Many of them reside almost entirely on the waters, fly little, and walk with difficulty, their feet being placed very far behind. Their wings are generally extremely short, and their flight, although sometimes rapid, is neither undulated nor buoyant. In some species they are reduced to mere organs of natation, the quills not being developed. All the species are furnished with a dense and short plumage, swim and dive with remarkable agility, and pursue their prey under the surface, employing their wings as well as their feet to aid their progress. They are generally distributed, migrate extensively, and breed in society, often on rocky islands or abrupt cliffs. This family may be divided into three tribes.

1st. The divers,—*Colymbidæ*, are characterized by their straight, compressed, pointed, smooth bill, linear and lateral nostrils, narrow wings, and short tail. In some the feet are lobed, in others webbed.

The grebes, genus *Podiceps* (Plate CCCCI. fig. 1), resemble the coots in the form of their feet, their anterior toes, instead of being connected by webs, being merely dilated by means of lateral lobes. Their body is generally short and depressed; their neck long and slender; their bill straight, compressed, tapering, and pointed; their nostrils linear and pervious. The legs (tibiæ) are entirely concealed in the abdomen; the tarsi are extremely compressed; and the claw of the middle toe is flattened and dilated. The plumage is remarkably soft, silky, and often, especially on the lower part, has a shining gloss. Their wings are very narrow, and their tail is generally reduced to a slight tuft of scarcely distinguishable feathers. These birds when on shore are obliged to stand in a nearly erect posture; but although they walk with difficulty, their flight

is rapid, and their motions on the water extremely quick. They dive and pursue their way under water with extreme agility, and when apprehensive of danger generally disappear under the surface, instead of flying off. Their food consists of small fishes, crustacea, mollusca, and insects, as well as seeds of aquatic plants; and they nestle in marshy places, laying several eggs, generally of a white colour. Their plumage varies so much, according to age and sex, that the species have been erroneously multiplied by authors. Four species inhabit Europe, of which two may be particularly mentioned.

The great crested grebe, *Podiceps cristatus*, is of the size of a mallard, blackish brown on the upper parts, with a white band on the wing, and of a silvery white beneath. The adults have a double black crest, and a large reddish ruff or tippet margined with black, on the upper part of the neck. This species inhabits the northern part of both continents, where it breeds, and whence it migrates southward on the approach of winter. The nest is made of rushes and flags, or other aquatic herbage; and the eggs, three or four in number, are of a greenish white. Several authors allege that the female sometimes succours her young, when fatigued or in danger, by carrying them on her back or beneath her wings. From their surprising agility in diving they are not inappropriately named water-witches and dippers in America. The skins are dressed and made into muffs and tippets.

The little grebe, or dobchick, *Podiceps minor*, is the smallest of the species, not exceeding ten inches in length. It is not uncommon in most parts of Europe, as well as in the north of Asia, and the country around Hudson's Bay. In large rivers and lakes individuals are said to be sometimes devoured by pike and other fishes. In the adult the upper parts are deep black, the lower silvery gray, the throat black, and the neck ferruginous.

The finfoots, *Podia*, Illig., have the feet lobed like the coots and grebes; but their tail is more developed, and their claws more pointed. (Plate CCCCI. fig. 2.) To this genus have been referred the African finfoot, *P. Senegalensis*, and the Surinam species, *P. Surinamensis*, which latter, however, is by some considered as belonging to *Anhinga*.

The divers properly so called, genus *Colymbus*, greatly resemble the grebes in form, but differ from them in having the toes regularly webbed, and the tail moderately developed. Their body is elongated, and somewhat depressed; their neck long, their head small, oblong, and compressed; their bill rather long, straight, and tapering to a point; their plumage short and close; their wings of moderate length, but very narrow. These birds are peculiarly aquatic, and while in search of food remain often longer submerged than on the surface, to which they seem occasionally to come merely for the purpose of respiring. They feed on fishes of various kinds, but generally of small size, as well as on crustacea. Like the grebes, they dive when alarmed, and are not easily raised from the water, although their flight, which is direct, is very rapid. On land they stand erect, and walk with difficulty. They are generally solitary, breed on the margins of lakes in the arctic regions, and lay two or three very elongated, dark-coloured, and spotted eggs. Their flesh is dark-coloured and unsavoury. Of this genus the more remarkable species are the following.

The great northern diver, *Colymbus glacialis*, is about two feet and three quarters long, with the upper parts black, spotted with white; the head and neck glossy black, with green reflections, the lower parts white; the tail has twenty feathers. This species is generally distributed in

¹ For some interesting general observations on certain genera of this order, the reader may consult "Remarks on the Pelagic Birds, and on certain other Palmipedes, considered especially as regards their habits and their geographical distribution in the Oceans of the Globe," published in Freycinet's *Voyage autour du Monde,—Partie Zoologique*, par MM. Quoy and Gaimard.

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pedes.

the cold and temperate climates of the northern hemisphere. It breeds in the arctic regions, generally on the margin of lakes, or on islands, laying three eggs of a dull olive tint spotted with dusky. "Far out at sea in winter," says Nuttall, "and in the great western lakes, particularly Huron and Michigan, in summer, I have often heard, on a fine calm morning, the sad and wolfish call of the solitary loon, which like a dismal echo seems slowly to invade the ear, and rising as it proceeds, dies away in the air. This boding sound to mariners, supposed to be indicative of a storm, may be heard sometimes for two or three miles, when the bird itself is invisible, or reduced almost to a speck in the distance. The aborigines, nearly as superstitious as sailors, dislike to hear the cry of the loon, considering the bird, from its shy and extraordinary habits, as a sort of supernatural being. By the Norwegians its long-drawn howl is, with more appearance of reason, supposed to portend rain." The flesh of this bird is dark and unpalatable; but its skin, with the feathers on, is used by various barbarous tribes as an article of clothing.

Two other species, of inferior size, the red-throated diver, *C. septentrionalis*, and the black-throated, *C. arcticus*, inhabit the same regions, and are nearly similar in habits. Both these birds breed in some of the northern parts of Scotland.

The guillemots, genus *URIA*, have the bill of moderate length, robust, straight, compressed, and pointed; the nostrils nearly basal, lateral, linear, and partially covered by short feathers. The head is rather large and oblong, the neck short. The legs are placed far back, and their feet differ from those of the divers in wanting the hind toe. Their wings are short, narrow, and pointed; but they fly with considerable speed, and their tail is very short and rounded. These birds migrate in small flocks, and collect in vast assemblages to breed on the abrupt precipices and rocky islands of the northern seas, whence they again retire towards the end of autumn. They form no nest, but deposit their single egg, which is pyriform and of great size, on the bare rock.

The common guillemot, *Uria troile*, is somewhat less than the mallard, and has the bill longer than the head; its upper parts are black, the lower white, as are the tips of the secondary quills; in summer the head is brown, and the adult has a black stripe behind the eye. This species is very abundant along the northern coasts of Europe and America, and nowhere more so than in the British seas.

Another species, about the same size, but distinguishable by having the bill shorter and much more robust, is the thick-billed guillemot, *Uria Brunnichii*, which also occurs in the northern seas of both continents, but does not extend so far south as the former.

The Greenland dove, or little guillemot of authors, has been considered by some as constituting a distinct genus, to which Cuvier has given the name of *CEPHUS*. It is about the size of a large pigeon, and is entirely black, excepting a large white space on the middle of the wing, and the feet, which are red. This species, unlike those mentioned above, breeds under stones or in the crevices of rocks, where it lays two or three light-coloured eggs, spotted with dusky. It is frequent in the northern seas, and breeds on the Scottish coasts in great numbers.

2d. The auks, — *Alcedæ*, which form the next group, are very closely allied to the guillemots, from which they are easily distinguished by their extremely compressed and vertically elevated bill, which is usually transversely furrowed. The toes are entirely webbed, but the hind toe is wanting, as in the guillemots, which they further resemble in their habits and distribution. This tribe may be divided into several subordinate genera.

The puffins, genus *FRATERCULA*, have the bill shorter than the head, and as high at the base as it is long, a circumstance which gives these birds an extraordinary appearance, and has given rise to the appellations of coulternebs and parrot-bills, vulgarly applied to them. At the base of the bill there is generally an elevated fold of bare skin; and the nostrils, which are close to the margin, are mere slits. The puffins fly with rapidity, in a direct line, at the height of only a few feet over the waves; swim and dive with extreme dexterity; and nestle in the crevices of rocks, or more generally in holes formed by themselves in the turf.

The species best known and most extensively distributed is the common puffin, *Fratercula arctica*, which is of the size of a pigeon or jackdaw, with the upper parts dusky, the lower white, a broad black band round the neck, the bill red, with three grooves across each mandible. It is abundant on the northern coasts of Europe and America, where it breeds in burrows formed by itself in the soil of unfrequented islands and headlands, making no proper nest, and laying a single whitish and pyriform egg.

Another species, having a still more singular appearance, on account of two tufts of silky feathers on its head, inhabits the shores of Kamtschatka, the Kurile Isles, and others lying between Asia and America. The skins are employed by the natives as an article of clothing.

Some species having the bill less elevated, somewhat quadrangular, and notched near the tip, have been distinguished by M. Temminck under the generic name of *PHALERIS*. Of these may be mentioned the *Ph. psittacula*, and *Ph. cristatella*, both inhabitants of the north-western coast of America, Kamtschatka, and the Kurile Isles.

The auks properly so called, or restricted genus *ALCA*, have the bill more elongated, and in shape somewhat resembling the blade of a common pocket-knife, its base being feathered as far as the nostrils. As an example of the errors into which persons little conversant with living birds may fall, may be adduced the following statement of Cuvier with regard to the auks: "Their wings are decidedly too small to sustain them, and they do not fly at all." So far is this from being the case with our common species, that it flies with as much celerity as the guillemot and puffin, and in its ordinary flight outstrips the gulls and terns, although these birds fly with greater buoyancy. The statement, however, is correct as applying to the great auk, which might perhaps with propriety be referred to a separate genus.

The species so common on our coasts, as well as on those of Europe and North America, is the razor-billed auk, *Alca torda*, which is about the size of the common guillemot, and similarly coloured, being black above and white beneath, with a white band on the wing, and a line or two of the same colour on the bill.

The great auk, *Alca impennis*, is the largest bird of this family, equalling a goose in size. Its colour is similar to that of the common species; but its bill, which is marked with eight or ten grooves, is entirely black, and it has an oval white spot between the bill and the eye. Its wings are reduced to a kind of paddles, and are similar to those of the penguins, so that it does not possess the faculty of flying. It inhabits the highest latitudes of the globe, but is extremely rare, so that specimens are of very unfrequent occurrence in collections, and the only one in this country is that of the British Museum. A few instances have occurred of its being seen on the northern coasts of Scotland. In the northern seas this remarkable bird seems to represent the species of the next group, which belong to the other extremity of the globe.

3d. The penguins, — *Aptenodidae*, are entirely destitute of the faculty of flying, their wings being converted into small, oblong, flattened paddles or fins, covered with mi-

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pedes.

Palmipedes. minute scale-like feathers. Their body is elliptical and depressed, their neck of moderate length, their head oblong, their bill of moderate length, generally slender and pointed, the upper mandible covered with feathers for a third of its length, or as far as the nostrils, whence a groove extends to the tip. Their legs are very short, and placed so far behind that they cannot support themselves on land, even in a vertical position, without resting on their tarsi, which are flattened behind, somewhat like the foot of a quadruped. Their life is chiefly spent on the ocean, and as they possess the faculties of swimming and diving in the highest degree of perfection, they are the most truly aquatic of all birds, and the analogues of the swallows, which are the most aerial. If any bird approaches nearly in structure and habits to a quadruped, the penguins may claim kindred with the seals, which they greatly resemble in their mode of life, going on shore merely to breed, and dragging themselves over the rocks in a similar manner.

The penguins peculiarly so named, genus *APTENODYTES*, as restricted, have the bill rather long, slender, and pointed, the upper mandible slightly arched towards the end, and covered with feathers at the base; the nostrils linear, with the nasal groove extending to the tip.

The Patagonian or great penguin, *Aptenodytes Patagonica* (Plate CCCCI. fig. 4), is nearly of the size of the great auk, of a dark-grayish blue above, white beneath, the head black, and a yellow curved band on the fore neck. It occurs in great flocks on the coasts of the Falkland Isles, New Guinea, New George, the Straits of Magellan, and other antarctic lands; feeds on fish, crustacea, and mollusca; and is employed by the natives as an article of food, although its flesh is dark-coloured and rank.

The gorfou, genus *CHRYSOCOMA*, have the bill short, strong, and somewhat conical, with the point a little arched. (Plate CCCCI. fig. 3 b.) The groove from the nostril ends about a third from the tip. In other respects they do not differ materially from the penguins.

The leaping gorfou, *Chrysocoma saltator*, is a handsome bird, of the size of a domestic duck, with the head and upper parts grayish black, the lower white, and the head ornamented with a large crest, of which the central part is erect and dusky, the lateral portions deflected, and of a yellow colour. It is common in the Falkland Islands and other parts of the southern seas; and, like the Patagonian penguin and other birds of this group, is said to be so stupid as to allow itself to be assailed without attempting to escape. It is extremely expert at diving; and like several birds of different families, such as the cormorants and darters, is often observed, while about to plunge beneath the surface, to leap several feet out of the water,—whence our sailors have named it the hopping penguin, or jumping Jack. The word gorfou is a corruption of goir-fugel, or gare-fowl, applied in Ferroe and the north of Scotland to the great auk, *Alca impennis*.

Several other species of this genus are known, and inhabit the same seas, such as the Papuan gorfou, *Chr. Papua*; the collared, *Chr. torquata*; the red-footed, *Chr. catarractes*; and the little gorfou, *Chr. minor*.

The sphenisques, genus *SPHENISCUS*, form a group characterized by their straight, compressed bill, which is irregularly grooved at the base, and has the tip of the upper mandible curved, while that of the lower is obliquely truncate, as in the cormorant. (Plate CCCCI. fig. 3 a.)

The Cape sphenisque, *Spheniscus demersus*, is about twenty inches long, black above, white beneath, with the throat and cheeks black, a white line over each eye, and a black band across the fore part of the neck, and extending along each side of the body. It occurs in the vicinity of the Cape of Good Hope, where it nestles in the rocks.

Another species, *Spheniscus Magellanicus*, upwards of

two feet long, with the upper parts, a band on the breast, and a collar on the middle of the neck, black, inhabits Terra del Fuego, the Straits of Magellan, and other parts of the antarctic regions, where they are very numerous. This species, like the gorfou, and probably all the birds of this tribe, has a habit of leaping several feet out of the water, either when about to dive, or when it meets with any obstacle on the surface.

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FAMILY II.—LONGIPENNÆ.

To this family belong those wandering sea-birds which, having a flight characterized by extreme buoyancy and rapidity combined, are met with on all parts of the ocean, frequently at the greatest distance from land. Their wings are always very long, although often extremely narrow; and their tail is proportionally developed. Their hind toe is small and free, or wanting; their bill pointed or hooked at the tip, but without lamellæ; their inferior larynx has only one muscle on each side; their œsophagus is wide, their stomach muscular, their cæca short. They are incapable of diving and pursuing their prey under the surface, but they swim with ease, and sit lightly and gracefully on the water. Some of them obtain their food by dipping or plunging from on wing, others by picking it up as they swim, while several wander to great distances in quest of dead animals of all kinds, and are in fact the vultures of the sea.

The petrels, *Procellariæ*, have their bill hooked at the tip, which seems as if formed of a separate piece articulated to the rest (Plate CCCCI. figs. 5, 6, and 9); their nostrils placed close together, and enclosed by a tube which lies on the back of the upper mandible; and their hind toe reduced to a knob with a claw upon it. These birds, although many of them are very small, reside on the open ocean, where they are met with by voyagers in the most tempestuous as in the calmest weather. Their food consists of small fishes, crustacea, and especially oily substances of all kinds; and most of them when seized, whether on being wounded or on being dragged from their holes, disgorge an oleaginous matter, or squirt it through their nostrils. They are incapable of diving, and seldom swim, but are generally seen flying or gliding over the surface of the waves, mounting upon their ridges and descending into the hollows, often so close as to seem walking on the water. Hence the name Petrel, or Little Peter, bestowed upon them, in allusion to St Peter's progress on the waves. In stormy weather they frequently fly in the wake of a ship, to shelter themselves from the wind. On account of this habit they are held in aversion by sailors, who, imagining them to be predictive of tempests, and in league with the mysterious source of evil, bestow on them the opprobrious appellation of Mother Carey's chickens. Their flight is rapid and buoyant; they breed in holes and crevices of the rocky coasts; and are more numerous in the antarctic than in the northern seas.

Those which have the lower mandible truncate are more peculiarly named petrels, genus *PROCELLARIA*.

Of these the largest is the giant petrel, *Procellaria gigantea*, which has a length of about three feet and a half, and is of a dusky colour above, whitish beneath, with the bill and legs yellow. It is of frequent occurrence in the southern seas, is observed to be most lively in stormy weather, and feeds on fishes, and the carcasses of seals, birds, and other animals.

The pintado, or Cape petrel, *Procellaria Capensis*, is about fourteen inches long, variegated with brown and white, and occurs in large flocks in the antarctic seas, particularly in the vicinity of the Cape of Good Hope. Like most of the other species, it flies very low, feeds on fish

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and the carcasses of cetaceous animals, and when caught squirts out a quantity of oil from the nostrils.

In the arctic seas a very abundant species is the fulmar petrel, *Procellaria glacialis*, which is nearly of the size of the herring gull, and has the upper parts of a light bluish-gray, the head and lower parts white. It is extremely voracious, and although its principal food consists of fish, it devours indiscriminately any floating animal substance, and follows in flocks the track of a wounded whale, until the huge animal is exhausted, when it alights on the carcass, and devours the blubber until satiated. This bird is one of those most familiar to the sailors of the whale-ships, on which it constantly attends, to pick up any offal that is thrown overboard, and come in for its share of the plunder when a whale has been captured. It breeds abundantly in the island of St Kilda, the inhabitants of which obtain a large quantity of oil from the stomachs of the individuals which they catch for that purpose.

Of the smaller dark-coloured species may be mentioned the common or storm petrel, *P. pelagica*, which is not larger than a lark, and in its flight resembles a swallow (Plate CCCC. fig. 5); Leach's petrel, *P. Leachii*; and Wilson's petrel, *P. Wilsonii*. Respecting the latter, we may quote the following passage from the description given of it by M. Audubon, in his *Ornithological Biography*. "But now, ever flapping its winglets, I have marked the little bird, dusky all over save a single spot, the whiteness of which contrasts with the dark hue of the waters, and the deep tone of the clear sky. Full of life and joy, it moves to and fro, advances towards the ship, then shoots far away, gambols over the swelling waves, dives into their hollows, and twitters with delight as it perceives an object that will alleviate its hunger. Never fatigued, the tiny petrels seldom alight, although at times their frail legs and feet seem to touch the crest of the foaming wave. I love to give every creature all the pleasure I can confer upon it, and towards the little things I cast over the stern such objects as I know they will most prize. Social creatures! would that all were as innocent as you! There are no bickerings, no jealousies, among you; the first that comes is first served: it is all the result of chance; and thus you pass your lives. But the clouds gather, the gale approaches, and our gallant bark is trimmed. Darkness spreads over the heavens, and the deep waters send back a blacker gloom, broken at intervals by the glimmer of the spray. You meet the blast, and your little wings bear you up against it for a while; but you cannot encounter the full force of the tempest; and now you have all come close beneath me, where you glide over the curling eddies caused by the motion of the rudder. You shall have all possible attention paid you, and I will crawl to the camboose, in search of food to support your tiny frames in this hour of need. But at length night closes around, and I bid you farewell.... The gale is over; the clear blue of the sky looks clearer than ever, the sun's rays are brighter, on the quiet waters the ship seems to settle in repose, and her wings, though widely spread, no longer swell with the breeze. At a distance around us the dusky wanderers are enjoying the bright morning; the rudder-fish, yesterday so lively, has ended its career, so violently was it beaten by the waves against the vessel; and now the petrels gather around it, as it floats on the surface. Various other matter they find; here a small crab, there the fragments of a sea-plant. Low over the deep they range, and now with little steps run on the waters. Few are their notes, but great their pleasure, at this moment. It is needless for me to feed them now, and therefore I will return to my task."

The puffin-petrels, genus *Puffinus*, are separated from the rest on account of their having the extremity of the lower mandible decurved as well as that of the upper, and

the nostrils opening, not by a common orifice, but by two distinct apertures. (Plate CCCC. fig. 9.)

Of this genus may be mentioned the cinereous puffin-petrel, *Puffinus cinereus*; the Manks petrel, *Pr. anglorum*; and the dusky petrel, *Pr. obscura*.

In the genus *HALADROMA* of Illiger, the throat is dilatable like that of the cormorants, and the hind toe is entirely wanting as in the albatrosses. In the genus *PACHYPTILA* of the same author, the bill is enlarged at the base, and its margins are garnished interiorly with fine delicately-pointed vertical lamellæ. (See Plate CCCC. fig. 6.)

The albatrosses, genus *DIOMEDEA*, are the largest and most powerful of all the feathered wanderers of the ocean. Their bill, which is large, strong, and sharp-edged, is terminated by a strong hook; their nostrils, which are tubular, are placed apart; and their feet are destitute of the hind toe. Their plumage is full, soft, and elastic, and their wings, although narrow, are exceedingly long. They are thus equally organized for swimming and flying, and are met with in all parts of the intra-tropical and southern oceans, sometimes following a ship in full sail for many days, to pick up the refuse thrown overboard. They fly with surprising buoyancy and speed, and are able to bear up against the most violent tempests. When fatigued or satiated they rest upon the waters. Their food consists of the carcasses of all sorts of animals, as well as live fishes, crustacea, mollusca, and other creatures, and their voracity is such that sometimes having gorged themselves to excess, they are unable for a time to fly, and may be caught or destroyed. Under these circumstances, however, birds generally disgorge the contents of their gullet and stomach, and by thus lightening themselves, are enabled to escape.

Of the different species of this genus, that which is the best known, as well as the largest, is the wandering albatross, *Diomedea exulans*. It is as large as a swan, being four feet in length, and measuring ten feet between the tips of its extended wings; its upper parts dusky, the lower white, the neck and sides transversely streaked with brown, the primary quills black, the bill yellowish white, the feet flesh-colour. This celebrated bird is principally met with in the seas adjacent to the Cape of Good Hope, and in those that separate the American continent from the Asiatic. It is extremely voracious, feeding on fishes, mollusca, and the carcasses of whales and other animals. It is said that when it cannot swallow a large fish at once, it introduces part of it, and waits until it is digested before swallowing the rest. Its flesh, although hard and dry, is eaten by the inhabitants of Kamtschatka, who use its bones for tobacco-pipes and needle-cases.

From the albatrosses to the larger birds of the next genus the transition is but slight, both as regards form and habits.

The gulls, genus *LARUS*, Plate CCCC. fig. 8, constitute an extensive group, of which representatives are found in all parts of the globe. They are characterized by their longish, compressed bill, of which the upper mandible is arched towards the end, while the lower is there furnished with an angular prominence. The nostrils, which are placed near the middle, are linear-oblong and pervious. Their body is generally light, the neck of moderate length, their head ovate and rather large, their legs of ordinary length, and their hind toe very small, or sometimes obsolete. Some of the species are met with in the open ocean, but it is chiefly along the coasts, and especially near the mouths of rivers, that they are most frequently seen, and in stormy weather they often make incursions over the land in search of worms, larvæ, and carrion. Their food consists chiefly of small fishes, crustacea, and mollusca; but to the larger species hardly

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any animal substance comes amiss. They breed along the shores, on unfrequented islands and headlands, laying in a hollow on the ground from two to four eggs, spotted with dusky.

Among the larger species, some are remarkable for the dark or blackish hue of their back and wings; but in general the colour of those parts is a light-grayish blue, while that of the lower is pure white. One species, the ivory gull, *Larus eburneus*, has the plumage entirely of the latter colour when in the adult state. The greater black-backed gull, *Larus marinus*, the smaller black-backed gull, *Larus fuscus*, and the thick-billed gull of New Holland, *Larus melanoleucos*, afford examples of the first kind above alluded to. The largest known species is the burgomaster, *Larus glaucus*, of a light-grayish blue above, white beneath, with the tail and tips of the wings also white. It inhabits the arctic regions of Europe and America, seldom making its appearance in the temperate climates. One of the most common species on our coasts is the herring gull, *Larus argentatus*, which remains with us throughout the year. A gradual transition is observable from these larger species, which assimilate to the albatrosses, to the smaller, which are intimately connected with the terns.

Some species having very peculiar characters, have been separated from the gulls, and formed into a genus apart. These are the jagers, genus *LESTRIS*, which have the tip of the upper mandible hooked, and the nostrils larger and placed nearer the end of the bill than those of the gulls. Their tail is generally pointed, their wings long, and their flight is extremely rapid. Although they occasionally fish for themselves, they obtain their food chiefly by attacking various species of gulls and terns, which they tease to make them disgorge their food, which they then swallow.

Of this genus the more remarkable species are the skua, *Lestris catarractes*, which is nearly equal in size to the great black-backed gull; the pomarine jager, *L. pomarinus*; and Richardson's jager, *L. Richardsonii*, which is common on our coasts in autumn, and breeds in the Shetland Islands and Hebrides.

The terns, genus *STERNA*, are generally of small size, and remarkable for their slender body, long and narrow wings, and forked tail. Their feet are extremely short, and their bill longish, compressed, and pointed. They very seldom swim, but, when fatigued or satiated with food, repose on the rocks or sands. Their flight is extremely buoyant, and they usually obtain their food by plunging after it into the water from on wing. From their form and the peculiar mode of flying, they have also obtained the name of sea-swallows.

The most common species on the coasts of Europe are the arctic tern, *Sterna arctica*; the common tern, *St. Hirundo*; and the little tern, *St. minuta*; but several other species occur there.

The noddies, genus *ANOUS*, differ from the terns in having the tail even at the end, and nearly equal with the wings. Their bill also is more like that of the smaller gulls. They are said to be so stupid as to allow themselves to be killed without attempting to fly off; but this only happens in places where they have not been accustomed to meet with man.

The species best known is the black noddy, *Anous niger* (*Sterna stolidus*, Linn.), which is very common in the tropical seas, and is of a sooty-brown, excepting the top of the head, which is grayish white. It often settles on the rigging of vessels, when the sailors sometimes catch it at night while asleep.

The skimmers, genus *RHYNCHOPS*, Plate CCCCII. fig. 7, are very nearly allied to the terns, but are distinguished from all other birds by the extraordinary form of their bill, of which the upper mandible is considerably shorter than

the lower, and grooved beneath, so as to receive the edge of the latter, which is extremely thin. They procure their food in the same manner as the terns, skimming along the surface of the water, and dipping their bill into it to seize a small fish, as opportunity occurs.

The only species whose habits are known is the black skimmer, *Rhynchops nigra*, which is about twenty inches long, its bill and feet red, its upper parts black, the lower white, its wings considerably longer than the tail. It occurs along the coasts of America, from New York to Brazil, breeding on the sandy shores in June, and continuing in flocks all the year.

FAMILY III.—TOTIPALMÆ.

The birds of which this family is composed are those to which the epithet *palmipede* is more peculiarly applicable; for not only are their anterior toes connected by webs or membranes, as in the other tribes, but their hind toe is similarly connected with the inner. Their tarsi are generally short, their wings and tail long, their neck elongated, and their bill rather slender, somewhat conical, but generally hooked at the joint. They swim, and for the most part dive, with admirable dexterity, generally fly with great celerity, feed entirely on fishes and other marine animals, and are remarkable among web-footed birds for frequently perching on trees.

The pelicans, *Pelecani*, comprehend those which have at the base of the bill a space destitute of feathers. The skin of their throat is extensible, their tongue very small, their gullet of great width, their cæca small, their nostrils mere slits, sometimes obsolete.

The pelicans properly so called, genus *PELECANUS*, Plate CCCCII. fig. 10, are distinguished from all other birds by the singular structure of their bill, of which the upper mandible, however, presents nothing very remarkable, while the lower has its rami extremely slender and elastic, with a large dilatable membranous bag attached to it. They are birds of large size, with wings of moderate length, the tail rounded, the feet short, and the claws curved.

The most remarkable species is the common pelican, *Pelecanus onocrotalus* (above referred to), which is as large as a swan, and entirely of a white colour tinged with red, excepting the alula and primary quills, which are black. Its length is nearly six feet, and its extended wings measure about fifteen. Its upper mandible is flattened, with a hook at the point; and the sac appended to the lower mandible extends about nine inches down the neck, and may be dilated so as to hold a man's head with ease. This pelican occurs in the tropical and warmer temperate regions of the old continent, and is common in the eastern countries of Europe. Its principal food is fish, which it catches with great dexterity, by plunging after it from on wing. In fishing it fills the gular pouch, and does not immediately devour its prey, but when it has obtained a sufficiency, returns to the shore, and swallows it at leisure. The female forms a large nest of grass in a marshy place, and lays two or three white eggs, similar to those of a swan.

The brown pelican, *P. fuscus*, of a grayish-brown colour, and nearly four feet in length, is common in most parts of America, and especially in the West Indies. A very large species, *P. australis*, of a white colour, with the upper part of the back, the quills, and tail, black, inhabits New Holland.

The cormorants, genus *PHALACROCORAX*, resemble the pelicans in their general form, but are destitute of the large gular sac, having merely a bare dilatable membrane at the base of the lower mandible. They differ farther in not procuring their prey by plunging after it from

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on wing, their mode of fishing being similar to that of the divers.

The common cormorant, *Phalacrocorax carbo*, is nearly as large as a goose, and has a brownish-black colour, with a white spot on the thigh, and streaks of the same colour on the head and neck. It nestles in the cavities of rocks, or on trees, laying three pale-green eggs, crusted with white calcareous matter; and is common in the northern parts of both continents. It is stated that this species was formerly trained in England for the purpose of catching fish. "When they come to the rivers," says Willughby, "they take off their hoods, and having tied a leather thong round the lower part of their necks, that they may not swallow down the fish they catch, they throw them into the river. They presently dive under water, and there for a time, with wonderful swiftness, they pursue the fish, and when they have caught them, they rise presently to the top of the water, and pressing the fish lightly with their bills, they swallow them, till each bird hath in this manner swallowed five or six fishes; then their keepers call them to the fist, to which they readily fly, and, little by little, one after another, vomit up all their fish, a little bruised with the nip they gave them in their bills. When they have done fishing, getting the birds on some high place, they loose the string from their neck, leaving the passage to the stomach free and open; and for their reward they throw them part of the prey they have caught, to each, perchance, one or two fishes, which they by the way, as they are falling in the air, will catch most dexterously in their mouths."

A very common species on our coasts is the crested cormorant, *Phal. cristatus*, which is of a dark-greenish colour, with a recurved frontal tuft, and resembles the preceding in its habits, breeding in the rocky caverns of islands and headlands. Many other species occur in different parts of the world, the genus being generally distributed.

The frigate-birds, genus *TACHYPETES*, differ from the cormorants in having the tail forked, the wings extremely elongated, the feet very short, with their webs emarginate, and the tip of both mandibles decurved. Their flight is extremely rapid and buoyant, and they prey upon fishes, which they capture by plunging after them from on wing, or obtain by forcing the gannets to disgorge. Only one species is well known.

The common frigate-bird, *Tachypetes aquilus*, is of a dusky colour, more or less variegated with white on the neck, and sometimes measures ten feet between the tips of its extended wings. It inhabits the tropical regions, and is found in great abundance on the island of Ascension. Its principal food consists of flying-fishes, which it captures during their aerial excursions. The following account of this remarkable species, generally known to navigators by the name of the man-of-war, or frigate, is given by Mr Audubon. "This bird is possessed of a power of flight, which I conceive superior to that of perhaps any other bird. However swiftly the Cayenne tern, the smaller gulls, or the jager, move on wing, it seems a matter of mere sport to it to overtake any of them. The goshawk, the peregrine, and the gyr-falcon, which I conceive to be the swiftest of our hawks, are obliged to pursue their victim, should it be a green-winged teal or passenger-pigeon, at times for half a mile, at the highest pitch of their speed, before they can secure them. The bird of which I speak comes from on high with the velocity of a meteor, and on nearing the object of its pursuit, which its keen eye has spied while fishing at a distance, darts on either side to cut off all retreat, and with open bill forces it to drop or disgorge the fish which it had just

caught. See him now! yonder, over the waves leaps the brilliant dolphin, as he pursues the flying-fishes, which he expects to seize the moment they drop into the water. The frigate-bird, who has marked them, closes his wings, dives towards them, and now ascending, holds one of the tiny things across its bill. Already fifty yards above the sea, he spies a porpoise in full chase, launches towards the spot, and in passing seizes the mullet that has escaped from its dreaded foe; but now, having obtained a fish too large for his gullet, he rises, munching it all the while, as if bound for the skies. Three or four of his own tribe have watched him, and observed his success. They shoot towards him on broadly extended pinions, rise in wide circles, smoothly, yet as swiftly as himself. They are now all at the same height, and each, as it overtakes him, lashes him with its wings, and tugs at his prey. See! one has fairly robbed him, but before he can secure the contested fish it drops. One of the other birds has caught it, but he is pursued by all. From bill to bill, and through the air, rapidly falls the fish, until it drops on the waters, and sinks into the deep. Whatever disappointment the hungry birds feel, they seem to deserve it all."

The boobies, or gannets, genus *SULA*, have the bill straight, conical, a little compressed, and with the point somewhat deflected, the edges serrate, or cut into by short parallel lines. The throat and the space around the eyes are bare; the claw of the middle toe serrate, the wings long and very narrow, and the tail cuneate or tapering. They hover over the water when fishing, and plunge headlong after their prey, resting a few moments on emerging before they resume their flight.

The common gannet or solan goose, *Sula bassana*, occurs on the coasts of Europe and North America, and breeds in vast numbers on remote and rocky islands. The Bass Rock at the entrance of the Frith of Forth is a well-known haunt of this species, as are Ailsa Craig in the Clyde, St Kilda, and Suliskerry. The nest is very bulky, and composed of sea-weeds; the single egg not larger than that of a domestic duck, and of a white colour; the young, at first covered with snow-white down, is when fledged of a dark-brown colour, spotted with white. Although the flesh of this species is rank and oily, it was formerly considered a kind of delicacy, and is still sparingly used in the south of Scotland.

The booby gannet, *Sula candida*, is inferior in size to the species just mentioned, which it closely resembles in form and habits. It is common on the coasts of the warmer parts of America, particularly in the Bahama Islands and the Brazilian seas. Although it sometimes nestles on the ground, it generally builds on trees, and reposes there at night. It is said to be a very stupid bird, allowing itself to be knocked on the head or seized, without attempting to escape,—whence the name of booby, commonly given to it by the sailors, who frequently employ it as an article of food, although its flesh is dark-coloured and disagreeable.

The darters, genus *Plotus*, resemble the cormorants in the form of their body and feet, but are more slender, and have a very elongated neck, with a small head, and a straight, slender, and pointed bill. Like the cormorants, they swim deep in the water, but with agility, and in diving spring fairly out of it to plunge headlong after their prey. They inhabit the warm countries of America.

The black-bellied darter, *Plotus melanogaster*, Plate CCCCII. fig. 1, is upwards of three feet long, of a dusky colour, with the neck and back streaked with white. The white-bellied darter, *P. ankinga*, is about the same size, but has the lower parts white. It inhabits Brazil and

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other parts of America, roosting at night on trees, whence, should one approach, they drop into the water as if dead; and on emerging at a distance, show only their long slender necks and heads, which bear so much resemblance to those of serpents, that this species is frequently named the snake-bird.

The tropic birds, genus *PHAETON*, which form the last group of this section, bear a considerable resemblance to the gannets, but are readily distinguished by the two extremely elongated feathers of their tail, on account of which the French give them the not inappropriate name of *paille-en-queue*. Their head is entirely feathered; their bill straightish, tapering, pointed, and denticulated on the edges; their feet are short, and their wings long. The flight of these birds is rapid and buoyant, and they are often seen far out at sea. As they seldom extend their range beyond the tropics, their occurrence apprises navigators of their entrance into the warmer regions. They perch and nestle upon trees.

Two species are distinguished;—the common, or white-tailed tropic bird, *Phaeton aethereus*; and the red-tailed species, *Ph. phœnicurus*. The former is white, with the ocular region and shoulders black, the primary quills of the same colour, and the bill red. It inhabits the Atlantic Ocean. The latter is of a pale rose-colour, or reddish white, with the ocular region and wing-coverts deep black, and the two elongated feathers of the tail red. It occurs in the Indian and African Seas, at Madagascar, the Cape of Good Hope, the Isle of France, and many of the South Sea islands.

FAMILY IV.—LAMELLIROSTRES.

The birds of this family are readily distinguished from those of the preceding by the peculiar structure of the bill, which has its margins furnished with horny lamellæ, or dentiform processes, and its surface covered with soft skin, in place of the horny envelope which is spread over that of the other Palmipedes. The tongue, which is broad and fleshy, has its margins also lamellate; the gizzard is extremely muscular, although not of large capacity, and the cæca are rather long. Another remarkable distinction is found in the lower larynx, which generally has a very extraordinary dilatation in the males. Their body is usually somewhat depressed, their wings of moderate length, their feet short, and their neck more or less elongated, sometimes of extreme length. They swim with ease, but walk in a constrained and vacillating manner; and are for the most part phytophagous, though many feed on mollusca, crustacea, and fishes. They occur in all parts of the globe,—some being maritime, but the greater number lacustrine or fluviatile, that is, frequenting lakes or rivers. They are naturally arranged into two groups;—the one (*Anatidæ*) comprising the swans, geese, and ducks; the other (*Mergidæ*) composed of the mergansers.

The great group of *Anatidæ* includes all those web-footed birds which have their bill large and broad, covered with a thin membrane, and having its edges furnished with transverse or oblique lamellæ, the object of which seems to be to allow the water to escape when the bird has seized its food. Vegetable substances, especially seeds, roots, and blades of grasses, form the principal nourishment of many of the species; but others feed on fishes, mollusca, insects, and worms. The piscivorous species dive in pursuit of their prey, while those which feed on vegetable matter either procure it on shore, or along the margins of the water, or, while floating on the surface, obtain it from some depth by means of their long neck. The flesh of many of these birds is much esteemed, but is not so readily digestible as that of the waders and gallinaceous

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order. Many of them moult twice in the year, and after the summer change the males assume in part the colours peculiar to the females, which, on the contrary, exhibit no variation. They generally breed in marshy places, and deposit numerous eggs. The young, which are at first covered with stiff down, are capable of walking and swimming immediately after birth.

The characters by which the subdivisions of this group are distinguished are derived chiefly from the form of the bill. In the swan that organ is as broad at its fore part as at the base, where its height is greater than its breadth, and the nostrils are placed about the middle. In the geese, the bill is shorter than the head, higher than broad at the base, and narrower towards the end. Lastly, in the ducks properly so called, the bill is at least as broad at its extremity as at the base, where it is broader than high; the nostrils are placed on the back of the bill near the base. In the swans the neck is extremely long, in the geese of moderate length, and in the ducks generally rather short.

The swans, genus *CYGNUS*, are the largest birds of the family, and are characterized by the elegance of their form, and the graceful ease with which they glide over the surface of the water, although on land their motions are more constrained. Their body is large, their neck extremely elongated, their head oblong, their wings large, and their feet short and strong. They live chiefly on the seeds and roots of aquatic plants, and nestle among the reeds by the margins of lakes and rivers. They are strictly monogamous, and the young swim and walk immediately after exclusion.

The wild swan, *Cygnus ferus*, has the bill yellow at the base, and black towards the end, the plumage pure white, but in the young of a gray colour. It is readily distinguished from the domestic swan by having the base of the bill flattened above, and by the curvature formed by the wind-pipe, which enters into a cavity in the crest of the sternum, from which it is reflected anteriorly, and then passes into the thorax. This species inhabits the northern regions of both continents, whence it migrates southward on the approach of winter, remaining in the temperate countries until the return of spring. The female lays from five to seven or eight eggs, of a whitish colour tinged with olive, and is said to incubate six weeks. The flesh and eggs are highly esteemed, and the skins are prepared with the down to be made into garments. The down itself forms an article of commerce, which is in considerable demand in the colder countries of Europe. The song of the swan is familiar to all the lovers of poetry; but, like many equally accredited facts, has no real existence; for the cry of this bird, although clear and shrill, is never modulated into harmony. When heard at a distance, however, especially from a flock on wing, it is extremely pleasing. Another fable regarding the vast strength of wing of this bird was long believed,—a blow from it being alleged as sufficient to break a man's thigh. "It is high time," says Montagu, "such absurdities should be erased in this philosophic age, and that the mind of man should reason before he continues to relate such accounts, only calculated to frighten children. Let the bones of the wing of the swan be examined, and compared with the thigh of a man, or even of his arm, and it will be evident that it would be as impossible for a swan to break a man's arm, as it would be to break his head with a reed. The bone of a man's arm would bear a pressure fifty times as great as the bone of a swan's wing; how, then, is the inferior in size and strength to break the superior, without at least being itself fractured? It should also be recollected, that a bird is incapable of striking with any degree of force while all its quill-feathers are perfect, the resistance of the air against such a surface being too great to allow of

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its moving with sufficient velocity to inflict any sensible pain."¹

A species very nearly allied to the above is Bewick's swan, *Cygnus Bewickii*, which was first distinguished as a species by Mr Yarrell and Mr Richard Wingate of Newcastle. It has the bill black, with its base orange yellow, the plumage white, and the tail of eighteen feathers, whereas there are twenty in that of the common wild swan. The curvature of the trachea is also different, and the size of the species is about a third smaller. It inhabits the arctic regions of both continents, migrating southward in winter.

The mute or tame swan, *Cygnus olor*, has the bill red, its edges, the nail at its tip, and a large knob at the base of the upper mandible, black; the plumage white, the tail of twenty-four feathers. In this species the trachea has no extra thoracic curvature. The tame swan is said to be found in its wild state in the eastern countries of Europe and Asia. It is generally distributed over Europe in a domesticated state, forming a great ornament to our rivers and artificial pieces of water. It makes its nest of grass, among reeds, and deposits seven or eight eggs of a greenish-white colour, which are hatched in seven or eight weeks. The young are of a gray colour, and were formerly much esteemed as an article of food.

The black swan, *Cygnus atratus*, of which the general colour of the plumage is brownish black, with part of the wings white, and the bill red, inhabits various parts of New Holland, and is now not uncommon in a domesticated state in this country. (See Plate CCCCII. fig. 5.)

Intermediate between the swans and geese are several species, such as the Guinea goose, *Anas cygnoides* of Linnæus, and the spur-winged or Gambia goose, *Anas Gambensis* of the same author,—which, although less elegant than the swans, are yet nearly allied to them in the form of their bill.

The geese, genus *ANSER*, are distinguished, as has been already said, by the form of their bill, which is short, and narrowed towards the point. Their feet are also proportionally longer than those of the ducks, so that they have a greater facility in walking. They swim less, however, and are incapable of diving. They live in flocks, feed on gramineous plants and seeds, migrate in large bodies, which during their flight are usually disposed in divergent lines, and breed in marshy places, laying numerous eggs. Those species which have the bill more slender and somewhat cylindrical, are separated by some authors to form the genus *BERNICLE*. Three species of geese properly so called, and two of bernicles, are not uncommon during winter in this and other countries of Europe.

That to which the origin of the domestic goose is attributed, the gray lag, or common wild goose, *Anser ferus*, is nearly three feet long, with the bill large and of an orange colour, the feet flesh-coloured, and the plumage light gray and clove brown; the rump and lower parts white. It was formerly very abundant in this country, where it resided all the year, but is now met with only in small flocks in the winter season, although a few individuals have recently been found to breed in the north of Scotland—for example, in the islets of the lochs of Sutherland.

The bean goose, *Anser segetum*, is a little smaller, with the bill more elongated, and of an orange colour, with its base and the nail black; the upper part ash-gray tinged with brown, the rump dark brown, the abdomen and lower tail-coverts white. This species is much more plentiful with us than the last, appearing in large flocks in November, and retiring northward in April and May.

The white-fronted goose, *Anser albifrons*, has the bill and legs orange, the plumage gray on the upper parts, on the lower white, and a patch of the same colour on the forehead.

The common bernicle, *Anser leucopsis*, which has the forehead, cheeks, and throat white, with the crown of the head, the neck, and the breast black, is not unfrequent on the western coast of Britain in winter; and the brent goose, *Anser torquatus*, characterized by having the head, neck, and breast black, with a white patch on each side of the neck, is also common in many parts, especially along our eastern shores. The former of these species was long believed, even by the learned, to be the produce of a species of cirripodous animal, the *Lepas anatifera* of Linnæus, the long feather-like branchiæ of which gave rise to this absurd fable.

Another species of bernicle was observed, on Captain Parry's second voyage, on Melville Peninsula, and named by Dr Richardson, in the *Fauna Boreali-Americana*, in honour of Mr Hutchins, from whom Pennant and Latham derived most of their information respecting the birds of Hudson's Bay. It is about twenty-five inches in length, with a very short black bill; the head, neck, rump, and tail pitch-black, and a white kidney-shaped patch upon the throat.

From the bernicles and geese some authors distinguish, under the generic name of spurwing, *CHENALOPEX*, the species usually named the Egyptian goose, which has the bill longer than the bernicles, and has the wings armed with a spur upon the bend. It inhabits various parts of Africa, especially Egypt and the Cape of Good Hope, whence it has been introduced into this country.

The next genus, *CEREOPSIS*, is formed by a New Holland species, resembling the bernicles in form, but with the bill smaller, and having at its base a membrane extending over the forehead. The palmation of the feet is not so full as usual.² (Plate CCCCII. fig. 2.)

The ducks, properly so called, have the legs much shorter than the geese, and placed farther back, the neck shorter, and the body more depressed. Their trachea also has a large dilatation at its bifurcation.

Some of them, having the hind toe margined with a membrane or lobe, the tarsi more compressed, the head larger, and the wings shorter, feed on fishes and other aquatic animals, and are less expert at walking, but dive with greater agility. These species have been variously grouped by authors into numerous genera, of which the following are among the more remarkable.

The scoters, genus *OIDEMIA*, have the bill short and broad, with an elevated tumour or knob at the base, but towards the tip much depressed and flattened, the nail obtuse and roundish; the lamellæ widely set, and scarcely projecting; the nostrils oval and sub-medial, the tail short and graduated.

To this genus belong the velvet scoter, *Oidemia fusca*; the black scoter, *O. nigra*; and the surf scoter, *O. perspicillata*; which occur along the coasts of the northern temperate regions in winter, feeding on fishes, and especially mussels and other testaceous mollusca. Like that of the other sea-ducks, their flesh is held in little estimation, being dark-coloured and tough, with a fishy flavour.

The garrots, genus *CLANGULA*, have the bill shorter than the head, elevated at the base, narrowed towards the end; the lamellæ numerous, but not projecting; the nostrils roundish, and medial; the tail of moderate length, and graduated.

The golden-eye, *Clangula chrysophthalma*, which is white, with the head, the back, and the tail black, a small

Palmi-
pedes.

¹ Ornithological Dictionary.

² For the history of the only known species, *Cer. Nova Hollandia*, see *Zoological Gardens*, vol. ii. p. 315.

Palmipedes. spot before the eye, and two bands on the wing, white, breeds in the arctic regions of both continents, and appears on the estuaries and lakes of the more temperate countries in winter. The female is of a gray colour, with the head brown.

To this genus belongs the harlequin-duck, *Clangula histrionica* (Plate CCCCII. fig. 3), which is distinguished by having a large patch of white on the lore, a spot on the ear, a longitudinal band on the sides of the neck, a transverse band on the neck, and another on each side of the breast, white; with the speculum or wing-spot blue, and the legs dusky. It derives its name from the singularity of its markings, and inhabits the northern parts of both continents.

The *pochards*, genus *FULIGULA*, have the bill as long as the head, broad and much depressed anteriorly, and a little dilated towards the tip; the upper lamellæ not projecting beyond the margin; the nostrils oblong, sub-basal; the wings and tail short, the latter rounded. This section contains a great number of species, most of which are maritime and piscivorous, although the flesh of many is considered palatable, and that of one, the canvass-backed duck, has been celebrated by the epicures of the western world.

The red-headed pochard, *Fuligula ferina*, of which the head and neck are bright chesnut, the breast black, the sides and scapulars marked with undulated lines of black and grayish white, is not uncommon on the coasts of Europe during the winter, and is not unfrequently seen in our markets.

Another common species is the scaup-pochard, *Fuligula marila*, which has the head and neck black glossed with green, the back and scapulars whitish with undulating black lines, and the alar speculum white.

The canvass-backed pochard just alluded to, *Fuligula valisneria* (Plate CCCCII. fig. 4), resembles the red-headed species, and is characterized by having the forehead and cheeks dull brown; the head and upper part of the neck fulvous, the lower part with a black belt; the back, scapulars, and belly white, marked with narrow black lines. These birds arrive in the United States from the arctic regions about the middle of October, and frequent the large rivers and lakes, where they feed chiefly on the roots of a grass-like plant, the *Valisneria spiralis*. Although extremely shy, vast numbers of them are killed on account of the delicacy of their flesh. Towards evening they collect into large flocks, so extensive as sometimes to cover several acres, and, when rising simultaneously on wing, to produce a noise like thunder.

The *eiders*, genus *SOMATERIA*, have the bill more elongated than that of the garrots, tumid and elevated at the base, and extending over the forehead in the form of two narrow processes; the lamellæ large and distant; the nostrils small, oval, and medial; the wings and tail short. The males are distinguished by their greater size and superior beauty. Only two species of this genus are known, both inhabiting the northern and temperate regions of Europe and America.

The common or St Cuthbert's eider, *Somateria mollissima*, is characterized by having the bill furnished at its base with lateral prolongations, in the form of two narrow flat lamellæ. The male has the lower parts black, the upper parts and the neck white, the top of the head violet-black, and the cheeks pale green. The female has the whole plumage reddish brown, with transverse black bars. This species is extremely abundant in Iceland, Lapland, Greenland, Spitzbergen, and the countries bordering on Hudson's and Baffin's Bays; but it is also common in all the northern parts of Europe and America. The female lays five or six pale greenish-gray eggs, and lines her nest, which is composed of sea-weeds and other maritime plants, with the fine and elastic gray down, which she plucks from her breast for that purpose. This down is carefully collected

in northern countries,—each nest being generally robbed twice in the season. One female is stated to yield half a pound of down, which, however, is reduced to one half by being cleaned. It is extremely soft and warm, and so elastic that two handfuls are sufficient to fill a quilt five feet square. In 1750, the Iceland Company at Copenhagen sold so much of this article as produced 3747 rix-dollars, in addition to what was sent directly to Gluckstadt. Besides supplying this valuable down, the eiders afford an esteemed article of food to the Greenlanders, who moreover convert their skins into warm and comfortable under garments. Although the species occurs in Britain, it is nowhere so plentiful as to afford enough of down to render it available as an article of commerce.

The king-eider, *Somateria spectabilis*, which has the lateral prolongations at the base of the bill in the form of two elevated, compressed tubercles, is very similar to the other species, and inhabits the same countries, breeding in the same manner, and lining its nest with down of equal quality, plucked from its own plumage. The skins are formed into winter garments by the inhabitants of Siberia and Kamtschatka; but as this species is not so numerous as the other, its down is not of equal importance in a commercial point of view.

Other groups of ducks have the hind toe not bordered by any membrane, the head smaller, the feet narrower, the neck longer, the bill less tapering, and the body more slender. They feed chiefly on vegetable substances, although they also devour fishes, insects, worms, and mollusca. In this section, likewise, various generic divisions have been made.

The *shovellers*, genus *RHYNCHASPIS*, have the bill longer than the head, with the upper mandible semi-cylindrical, and enlarged at the end, and the lamellæ so long and slender as to resemble filaments.

The common shoveller, *Rhynchaspis clypeata*, inhabits various parts of the north of Europe and America, and is sometimes met with in England. It is about twenty inches in length, with the head and neck glossy-green, the back brown, the breast and abdomen brownish red, and the smaller wing-coverts pale blue.

Another species, the fasciated shoveller, *Rhynchaspis fasciata*, of a rusty-brown colour, transversely striped with white beneath, and having the tip of the bill membranaceous, is a native of New South Wales.

The *shielducks*, genus *TADORNA*, have the bill tumid and elevated at the base, where there is a small tubercle, but much flattened towards the point; the lamellæ short and distant; the nostrils oval and medial.

The common shieldrake, *Tadorna Bellonii*, which is one of the most beautiful species of this family, is not very uncommon in some parts of Britain, and occurs also on the coasts of the northern and western countries of Europe. It is characterized by having the head and upper part of the neck greenish black; the back, wing-coverts, and flanks white; the scapulars black, and a broad band on the breast ferruginous. The female nestles in a rabbit-burrow, or other hole in the sandy pastures on the sea-shore, generally forming her nest of down plucked from her breast, and laying from eight to twelve white eggs. Instances have occurred of its breeding with the common duck; and Montagu states that it bears confinement well, appearing to enjoy perfect health, provided access to a pond is allowed it.

The *musk-ducks*, genus *CAIRINA*, have the bill also furnished with an elevated tubercle at the base; the edges of the mandibles sinuated; the face and lores covered with a bare tuberculated skin; and the wings furnished with a knob or spur at the bend.

The common musk-duck, *Cairina moschata*, which is now generally distributed over Europe in a domesticated

Palmipedes.

Palmi-
pedes.

state, is a native of the warmer parts of America. In its natural state it has the plumage entirely of a black colour, glossed with green and blue, excepting the wing-coverts, which are white.

The *pintails*, genus *DAFILA*, have the bill destitute of tubercle at the base, narrow, somewhat cylindrical, with its edges dentato-laminate; the nostrils are basal, and the tail elongated, and tapering to a point.

The common pintail, *Dafila acuta*, has the head umber-brown, with a longitudinal white line on each side of the occiput and hind neck; the back and flanks undulated with black and grayish white; the lower parts white; and the two central tail-feathers black. It breeds in the arctic regions of Europe, Asia, and America; retires southward in winter; is very shy and vigilant; and is much esteemed as an article of food.

The ducks, strictly so called, genus *ANAS*, are distinguished by having the bill simple at the base, as long as the head, depressed, broad, and obtuse; the nostrils oval and small; the tail moderate, even, or rounded, often with the middle feathers and their coverts recurved.

Of this genus, the most common species in Europe is that which is supposed to be the original of the domestic duck, and which with us is named the wild duck or mallard, *Anas boschas*. The male is a very beautiful bird, having the head and upper part of the neck deep green, the latter with a white ring; the four middle tail-feathers recurved; the upper parts marked with fine undulated grayish-brown and white lines, the breast deep chesnut, the lower parts grayish white, undulated with grayish-brown lines; the alar spot green, edged above and below with white. It inhabits all the northern countries of the globe, and is common in Britain, where it breeds, forming its nest of withered plants in marshy places, and laying from ten to fifteen bluish-white eggs. Instances have occurred of its occupying the deserted nest of a crow. Its flesh is justly held in great estimation, and vast numbers are shot and caught in decoys. The following account of the method employed in capturing wild ducks in the fens of Lincolnshire is given by Bewick.

"In the lakes where they resort, the most favourite haunts of the fowl are observed: then in the most sequestered part of this haunt they cut a ditch about four yards across at the entrance, and about fifty or sixty yards in length, decreasing gradually in width from the entrance to the farther end, which is not more than two feet wide. It is of a semicircular form, but not bending much for the first ten yards. The banks of the lake, for about ten yards on each side of this ditch (or pipe, as it is called), are kept clear from reeds, coarse herbage, &c. in order that the fowl may get on them to sit and dress themselves. Across this ditch, poles on each side, close to the edge of the ditch, are driven into the ground, and the tops bent to each other, and tied fast. These poles at the entrance form an arch, from the top of which to the water is about ten feet. This arch is made to decrease in height as the ditch decreases in width, till the farther end is not more than eighteen inches in height. The poles are placed about six feet from each other, and connected together by poles laid lengthwise across the arch, and tied together. Over them a net with meshes sufficiently small to prevent the fowl getting through is thrown across, and made fast to a reed fence at the entrance, and nine or ten yards up the ditch, and afterwards strongly pegged to the ground. At the farther end of the pipe a tunnel-net, as it is called, is fixed, about four yards in length, of a round form, and kept open by a number of hoops about eighteen inches in diameter, placed at a small distance from each other to

keep it distended. Supposing the circular bend of the pipe to be to the right, when you stand with your back to the lake, on the left-hand side, a number of reed-fences are constructed, called shootings, for the purpose of screening from sight the *decoy-man*, and in such a manner that the fowl in the decoy may not be alarmed when he is driving those in the pipe: these shootings are about four yards in length, and about six feet high, and are ten in number. From the end of the last shooting a person cannot see the lake, owing to the bend in the pipes: there is then no farther occasion for shelter. Were it not for these shootings, the fowl that remain about the mouth of the pipe would be alarmed, if the person driving the fowl already under the net should be exposed, and would become so shy as to forsake the place entirely. The first thing the decoy-man does when he approaches the pipe, is to take a piece of lighted turf or peat, and hold it near his mouth, to prevent the fowl smelling him. He is attended by a dog taught for the purpose of assisting him; he walks very silently about half-way up the shootings, where a small piece of wood is thrust through the reed fence, which makes an aperture just sufficient to see if any fowl are in; if not, he walks forward to see if any are about the mouth of the pipe. If there are, he stops and makes a motion to his dog, and gives him a piece of cheese or something to eat; upon receiving it, he goes directly to a hole in the reed fence, and the fowl immediately fly off the bank into the water; the dog returns along the bank between the reed-fences and the pipe, and comes out to his master at another hole. The man now gives him another reward, and he repeats his round again, till the fowl are attracted by the motion of the dog, and follow him into the mouth of the pipe. This operation is called working them. The man now retreats farther back, working the dog at different holes till the fowl are directly under the net; he now commands his dog to lie down still behind the fence, and goes forward to the end of the pipe next the lake, where he takes off his hat, and gives it a wave between the shooting; all the fowl under the net can see him, but none that are in the lake can. The fowl that are in sight fly forward, and the man runs forward to the next shooting and waves his hat, and so on, driving them along till they come to the tunnel-net, where they creep in: when they are all in he gives the net a twist, so as to prevent their getting back; he then takes the net off from the end of the pipe with what fowl he may have caught, and takes them out one at a time, and dislocates their necks, and hangs the net on again, and all is ready for working again. In this manner five or six dozen have been taken at one drift. When the wind blows directly in or out of the pipes, the fowl seldom work well, especially when it blows in. If many pipes are made in the lake, they are so constructed as to suit different winds."¹ The better to entice the fowl into the pipe, hempseed is strewed occasionally in the water. The season allowed by act of parliament for catching these birds in this way is from the latter end of October till February.

The Chinese duck, *Anas galericulata*, with a pendent crest, and the inner wing-feathers enlarged and raised in a vertical direction, is an extremely beautiful species, a native of China and Japan.

The summer duck, *Anas sponsa*, which also has a pendent crest, is not less beautiful. (Plate CCCCII. fig. 8.) It inhabits Mexico and other parts of North America, migrating northward in summer, rarely visiting the seashore or salt marshes, but frequenting the muddy creeks, ponds, and mill-dams of the interior.

The tree duck, *Anas arborea*, of a gray colour, the ab-

Palmi-
pedes.

¹ *British Birds*, vol. ii. p. 294.

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System.

domen spotted with black and white, and the head slightly crested, inhabits the warmer parts of America, and is remarkable for building in the holes of decayed trees.

The gadwall or gray, *Anas strepera*, the Dominican duck, *A. Dominicana*, the Spanish duck, *A. viduata*, and many other species, belong to this genus,—which might include the teals, although these are separated by several authors.

The wigeons, genus *MARECA*, may be distinguished from the ducks, as they have the bill shorter than the head, higher than broad at the base, depressed and narrowed towards the end; the lamellæ slightly projecting; the tail short and acute. They are, however, very intimately allied to the pintails.

Of this genus one of the best examples is the common wigeon, *Mareca Penelope*, which has the forehead yellowish white, the rest of the head and the neck chesnut-red, the back and flanks undulated with black and white. The male of this species has been known to pair with the female pintail, and produce a hybrid brood. It also pairs with the common duck. Wigeons are abundant in winter in many parts of Britain, and are very much esteemed for the table.

The teals, genus *QUERQUEDULA*, are distinguished from the other groups by their diminutive size. Their bill is narrower than that of the wigeons, proportionally longer, and has its base more elevated. The species are generally very beautiful.

The garganey teal, *Querquedula circia*, of a gray colour, variegated with black, and having a white streak above the eyes, with a green spot on the wing, inhabits the more temperate parts of Europe, and is abundant in Holland during its winter migration.

The common teal, *Querquedula crecca*, which has the head brownish red, the body transversely undulated with dusky, a white line above and another beneath the eye, and the alar spot black and green, is plentiful in many parts of Europe and North America; while the blue-winged teal, *Q. discors*, characterized by the light blue

colour of the wing-coverts, is peculiar to the latter continent, as is likewise the American teal, *Q. Carolinensis*.

The second principal group named *Mergidæ*, consisting of the genus *Mergus* of Linnæus, includes the remaining birds of the great family of Lamellirostres, which are usually designated by the vernacular name of *mergansers*. They differ from the ducks in having their bill slender, almost cylindrical, and furnished on the margins with dentiform points directed backwards, and resembling the teeth of a saw. (Plate CCCII. fig. 6.) Their summer residence is in the colder regions of both continents, whence they migrate southward on the approach of winter. Their body is elongated and depressed, their feet short and placed far behind, their wings rather long and narrow, their neck of moderate length. They fly with rapidity, swim and dive with the greatest facility, and generally feed on fishes. In their habits they are intermediate between the ducks and divers; but in their organization and plumage they are more nearly allied to the former. Their tracheæ, besides having an exceedingly large dilatation at its bifurcation, is also enlarged previous to its entrance into the thorax. In accordance with their piscivorous propensities, their gullet is wider than that of the ducks, and their gizzard less muscular.

Three species occur in the temperate parts of Europe. The goosander, *Mergus merganser*, of which the male is black, with the lower parts buff-coloured, and the head purplish green, with a slender elongated crest; the red-breasted merganser, *M. serrator*, about the size of the mallard, also crested, the male black above, white beneath, with the head dark green; and the smew, *M. albellus*, which is smaller than the golden-eye, varied with black and white, and having a large compressed white crest. All these occur also in the northern parts of America, which has moreover a species peculiar to itself, the hooded merganser, *M. cucullatus* (Plate CCCII. fig. 7), of a blackish colour above, white beneath, with a semicircular black crest, white on each side. The females and young of all the species differ greatly in colour from the adult males. (T.)

 Illiger's
System.

THE ORDERS, FAMILIES, AND GENERA, OF BIRDS, ACCORDING TO THE SYSTEM OF ILLIGER.¹

ORDER I.—SCANSORES.

Family <i>Psittacini</i>	Gen. <i>Psittacus</i> , <i>Pezoporus</i> (πεζοπορος, pedester).
Family <i>Serrati</i>	Gen. <i>Rhamphastos</i> , <i>Pteroglossus</i> (πτερον, penna, γλωσσα, lingua), <i>Pogonias</i> (πωγωνιας, barbatus), <i>Corythaix</i> (κορυθαίξ, galea, cristam movens), <i>Trogon</i> , <i>Musophaga</i> .
Family <i>Amphiboli</i>	Gen. <i>Crotophaga</i> , <i>Scythrops</i> , <i>Bucco</i> , <i>Cuculus</i> , <i>Centropus</i> (κεντρον, stimulus, calcar; πους, pes).
Family <i>Sagittilingues</i>	Gen. <i>Yunx</i> , <i>Picus</i> .
Family <i>Syndactyli</i>	Gen. <i>Galbula</i> .

ORDER II.—AMBULATOIRES.

Family <i>Angulirostres</i>	Gen. <i>Alcedo</i> , <i>Merops</i> .
Family <i>Suspensi</i>	Gen. <i>Trochilus</i> .
Family <i>Tenuirostres</i>	Gen. <i>Nectarinia</i> (nectar florum haurientes), <i>Tichodroma</i> (τιχος, murus, δρομος, cursitans), <i>Upupa</i> .

¹ *Prodrömus Mammalium et Avium*, Berlin, 1811.

Illiger's System.	Family <i>Pygarrhichi</i>	Gen. <i>Certhia</i> , <i>Dendrocolaptes</i> .	Illiger's System.
	Family <i>Gregarii</i>	Gen. <i>Xenops</i> (<i>ξενος, inusitatus, novus, ωψ, vultus</i>), <i>Sitta</i> , <i>Buphaga</i> , <i>Oriolus</i> , <i>Cassicus</i> , <i>Sturnus</i> .	
	Family <i>Canori</i>	Gen. <i>Turdus</i> , <i>Cinclus</i> , <i>Accentor</i> , <i>Motacilla</i> , <i>Muscicapa</i> , <i>Myiothera</i> (<i>μυια, musca, θησαυ, venor, capto</i>), <i>Lanius</i> , <i>Sparactes</i> (<i>σπαρακτης, lanio, lacerator</i>), <i>Todus</i> , <i>Pipra</i> .	
	Family <i>Passerini</i>	Gen. <i>Parus</i> , <i>Alauda</i> , <i>Emberiza</i> , <i>Tanagra</i> , <i>Fringilla</i> , <i>Loxia</i> , <i>Colius</i> , <i>Glaucopis</i> , <i>Phytotoma</i> .	
	Family <i>Dentirostres</i>	Gen. <i>Prionites</i> (<i>πριων, serra</i>), <i>Buceros</i> .	
	Family <i>Coraces</i>	Gen. <i>Corvus</i> , <i>Coracias</i> , <i>Paradisea</i> , <i>Cephalopterus</i> , <i>Gracula</i> .	
	Family <i>Sericati</i>	Gen. <i>Ampelis</i> , <i>Procnias</i> .	
	Family <i>Hiantes</i>	Gen. <i>Hirundo</i> , <i>Cypselus</i> , <i>Caprimulgus</i> .	

ORDER III.—RAPTORES.

Family <i>Nocturni</i>	Gen. <i>Strix</i> .
Family <i>Accipitrini</i>	Gen. <i>Falco</i> , <i>Gypogeranus</i> (<i>γυψ, vultur, γερανός, grus</i>), <i>Gypaëtus</i> .
Family <i>Vulturini</i>	Gen. <i>Vultur</i> , <i>Cathartes</i> (<i>καθαρτης, purgator</i>).

ORDER IV.—RASORES.

Family <i>Gallinacei</i>	Gen. <i>Numida</i> , <i>Meleagris</i> , <i>Penelope</i> , <i>Crax</i> , <i>Opisthocomus</i> (<i>Hoffmansegg, οπισθοκομος, occipite comatus</i>), <i>Pavo</i> , <i>Phasianus</i> , <i>Gallus</i> , <i>Menura</i> , <i>Tetrao</i> , <i>Perdix</i> .
Family <i>Epollicati</i>	Gen. <i>Ortygis</i> (<i>ορτυξ, coturnix</i>), <i>Syrnhaptes</i> (<i>συρναπτειν, consuere</i>).
Family <i>Columbini</i>	Gen. <i>Columba</i> .
Family <i>Crypturi</i>	Gen. <i>Crypturus</i> (<i>κρυπτειν, occultare, ουρη, cauda</i>).
Family <i>Inepti</i>	Gen. <i>Didus</i> .

ORDER V.—CURSORES.

Family <i>Proceri</i>	Gen. <i>Casuarius</i> , <i>Struthio</i> , <i>Rhea</i> .
Family <i>Campestres</i>	Gen. <i>Otis</i> .
Family <i>Littorales</i>	Gen. <i>Charadrius</i> , <i>Calidris</i> , <i>Himantopus</i> , <i>Hæmatopus</i> , <i>Tachydromus</i> (<i>ταχυδρομος, velociter currens</i>), <i>Burhinus</i> .

ORDER VI.—GRALLATOIRES.

Family <i>Vaginati</i>	Gen. <i>Chionis</i> .
Family <i>Alectorides</i>	Gen. <i>Glareola</i> , <i>Cereopsis</i> , <i>Dicholophus</i> (<i>διρχα, bifariam; λοφος, crista</i>), <i>Palamedea</i> , <i>Chauna</i> (<i>χαυνος, fungosus, inflatus, inanis</i>), <i>Psophia</i> .
Family <i>Herodii</i>	Gen. <i>Grus</i> , <i>Ciconia</i> , <i>Ardea</i> , <i>Eurypyga</i> (<i>ευρυς, latus, πυγη, anus, cauda</i>), <i>Scopus</i> , <i>Cancroma</i> , <i>Anastomus</i> .
Family <i>Falcati</i>	Gen. <i>Tantalus</i> , <i>Ibis</i> .
Family <i>Limicolæ</i>	Gen. <i>Numenius</i> , <i>Scolopax</i> , <i>Ereunetes</i> (<i>ερευνητης, explorator</i>), <i>Actitis</i> (<i>ακτιτις, in littore degens</i>), <i>Strepsilas</i> (<i>στρεψειν, vertere, λάς, lapis</i>), <i>Tringa</i> .
Family <i>Macroductyli</i>	Gen. <i>Parra</i> , <i>Rallus</i> , <i>Crex</i> .
Family <i>Lobipedes</i>	Gen. <i>Fulica</i> , <i>Podoa</i> (<i>πους, pes, ῥα, limbus, hmbria</i>), <i>Phalaropus</i> .
Family <i>Hygrobata</i>	Gen. <i>Corrira</i> , <i>Recurvirostra</i> , <i>Platalea</i> , <i>Phænicopterus</i> .

ORDER VII.—NATATOIRES.

Family <i>Longipennes</i>	Gen. <i>Rhyncops</i> , <i>Sterna</i> , <i>Larus</i> , <i>Lestris</i> (<i>ληστρις, prædatrix</i>).
Family <i>Tubinares</i>	Gen. <i>Procellaria</i> , <i>Haladroma</i> (<i>αλαδρομας, in mare cursitans</i>), <i>Pachyptila</i> (<i>παχυς, densus, πτελον, pluma</i>), <i>Diomedea</i> .
Family <i>Lamelloso-dentati</i> ...	Gen. <i>Anas</i> , <i>Anser</i> , <i>Mergus</i> .
Family <i>Steganopodes</i>	Gen. <i>Pelecanus</i> , <i>Haliæus</i> (<i>αλευς, piscator</i>), <i>Dysporus</i> , <i>Phaëton</i> , <i>Plotus</i> .
Family <i>Pygodopes</i>	Gen. <i>Colymbus</i> , <i>Eudytes</i> (<i>υ, bene, facile, ουτης, urinator</i>), <i>Uria</i> , <i>Mormon</i> (<i>μορμων, larva</i>), <i>Alca</i> .
Family <i>Impennes</i>	Gen. <i>Aptenodytes</i> .

THE ORNITHOLOGICAL SYSTEM OF M. TEMMINCK.¹

ORDER I.—RAPACES.

Genera.—Vultur, Cathartes, Gypætus, Gypogeranus, Falco, Strix.

ORDER II.—OMNIVORES.

Genera.—Opisthocomus, Buceros, Prionites, Corvus, Nucifraga, Pyrrhocorax, Barita, Glaucopsis, Gracula, Buphaga, Bombycivora, Ptilonorhynchus, Coracias, Colaris, Oriolus, Icterus, Sturnus, Pastor, Paradisea, Lamprotornis.

ORDER III.—INSECTIVORES.

Genera.—Turdus, Cinclus, Menura, Pitta, Myothera, Tamnophilus, Vanga, Lanius, Psaris, Sparactes, Ocypterus, Criniger, Edolius, Ceblepyris, Coracina, Ampelis, Casuarhynchus, Procnias, Rupicola, Phibalura, Pipra, Pardalotus, Todus, Pityrhynchus, Muscipeta, Muscicapa, Malurus, Sylvia, Saxicola, Accentor, Motacilla, Anthus.

ORDER IV.—GRANIVORES.

Genera.—Alauda, Parus, Emberiza, Tanagra, Ploceus, Loxia, Psittirostra, Pyrrhula, Fringilla, Phytotoma, Colius.

ORDER V.—ZYGODACTYLI.

First Family.

Genera.—Musophaga, Indicator, Cuculus, Coccyzus, Centropus, Phœnicophaeus, Leptosomus, Scythrops, Pteroglossus, Ramphastos, Crotophaga, Trogon, Capito, Bucco, Pogonias, Psittacus.

Second Family.

Genera.—Picus, Yunx.

ORDER VI.—ANISODACTYLI.

Genera.—Oxyrinus, Orthonyx, Dendrocolaptes, Xenops, Anabates, Opetiorynchos, Certhia, Cereba, Trochilus, Nectarinia, Climacteris, Tichodroma, Upupa, Epimachus, Drepanis, Meliphaga.

ORDER VII.—ALCIONES.

Genera.—Merops, Alcedo, Dacelo.

ORDER VIII.—CHELIDONES.

Genera.—Hirundo, Cypselus, Caprimulgus.

ORDER IX.—COLUMBÆ.

Genus.—Columba.

ORDER X.—GALLINÆ.

Genera.—Pavo, Gallus, Phasianus, Lophophorus, Polyplectron, Meleagris, Argus, Numida, Pauxi, Crax, Penelope, Tetrao, Pterocles, Syrrhaptes, Perdix, Cryptonyx, Tinamus, Hemipodius.

ORDER XI.—ALECTORIDES.

Genera.—Psophia, Dicholophus, Glareola, Palamedea, Chauna.

ORDER XII.—CURSORES.

Genera.—Struthio, Rhea, Casuarius, Otis, Cursorius.

ORDER XIII.—GRALLATOIRES.

First Family.

Genera.—Ædicnemus, Calidris, Falcinellus, Himantopus, Hæmatopus, Charadrius.

Second Family.

Genera.—Vanellus, Streptopus, Grus, Aramus, Ardea, Ciconia, Anastomus, Scopus, Phœnicopterus, Recurvirostra, Cancroma, Platalea, Tantalus, Ibis, Numenius, Tringa, Totanus, Limosa, Scolopax, Rynchæa, Eurypyga, Rallus, Gallinula, Parra, Porphyrio.

ORDER XIV.—PINNATIPEDES.

Genera.—Fulica, Podia, Phalaropus, Podiceps.

ORDER XV.—PALMIPEDES.

Genera.—Cereopsis, Chionis, Rynchops, Sterna, Larus, Lestris, Procellaria, Pachyptila, Haladroma, Diomedea, Anas, Mergus, Pelecanus, Carbo, Tachypetes, Sula, Plotus, Phaëton, Uria, Phalaris, Mormon, Alca, Spheniscus, Aptenodytes.

ORDER XVI.—INERTES.

Genera.—Apteryx, Didus.

THE CLASSIFICATION OF BIRDS, AS PROPOSED BY MR VIGORS.²

ORDER I.—RAPTORES, Ill. (Accipitres, Linn.)

1ST FAMILY. —?—Gen. Gypogeranus, Ill. (Serpentarius, Cuv.; Ophiotheres, Vieill.).

2D FAMILY. VULTURIDÆ.—1. — Gen. Cathartes, Ill. (Cathartus, Vieill.); 2. — Gen. Sarcophagus, Dum. (Cathartus pars, Ill.; Gypagrus, Vieill.); 3. — Gen. Gyps, Sav.; Vultur, Auct. (Ægyptius, Sav.); 4. — Gen. Gypætus, Storr. (Phene, Sav.); 5. — Gen. Neophron, Sav. (Cathartus pars, Temm.).

3D FAMILY. FALCONIDÆ, Leach.—1. Sub-fam. *Aquilina*. Gen. Ibycter, Vieill.; Daptrius, Vieill.; Polyborus, Vieill.; Pandion, Sav.; Halæetus, Sav.; Aquila, Auct.; Harpyia, Cuv.; Phytosia, Vieill.; Morphnus, Cuv. (Spizaëtus, Vieill.); Cymindis, Cuv.; Asturina,

Vieill. 2. Sub-fam. *Accipitrina*. Gen. Dædalion, Sav.; Astur, Auct. (Sparvius, Vieill.); Accipiter, Auct.; Harpagus; Gampsonyx. 3. Sub-fam. *Falconina*. Gen. Hierax, Vig.; Falco, Auct. 4. Sub-fam. *Buteonina*. Gen. Ictinia, Vieill.; Circus, Auct.; Pernis, Cuv.; Buteo, Auct. 5. Sub-fam. *Milvina*. Gen. Elanus, Sav.; Naucclerus, Vig.; Milvus, Auct.

4TH FAMILY. STRIGIDÆ, Leach.—1. Sub-fam. *Noctuidina*. Gen. Surnia, Dum.; Noctua, Sav. 2. Sub-fam. *Bubonina*. Gen. Scops, Sav.; Bubo, Cuv. 3. Sub-fam. *Asionina*. Gen. Asio, Antig. (Olus, Cuv.). 4. Sub-fam. *Strigina*. Gen. Ulula, Cuv.; Strix, Auct. 5. Sub-fam. *Syrniina*. Gen. Syrnium, Linn.

5TH FAMILY. —?—

¹ From the *Manuel d'Ornithologie*, i. xlviii. 1820.
VOL. XVI.

² In the *Zoological Journal*, No. vii. p. 392. 1825.
4 M

Vigors's
System.

ORDER II.—INSESSORES. (Picæ, Passeres, Linn.)

Tribe I.—Fissirostres, Cuv.

1ST FAMILY. MEROPIDÆ.—Gen. Merops, Linn. (Apister, Briss.).

2D FAMILY. HIRUNDINIDÆ.—Gen. Cypselus, Ill. (Apus, Cuv.; Micropus, Meyer); Hirundo, Auct.

3D FAMILY. CAPRIMULGIDÆ.—Gen. Caprimulgus, Auct.; Podargus, Cuv.; Ægotheles, Vig. and Hors.; Steatornis, Humb.; Nyctebius, Vieill.

4TH FAMILY. TODIDÆ.—Gen. Eurylaimus, Horsf.; Eurystomus, Vieill. (Colaris, Cuv.); Todus, Auct.

5TH FAMILY. HALCYONIDÆ.—Gen. Alcedo, Linn. (Ispida, Briss.); Halcyon, Swains.; Dacelo, Leach; Tanyptera, Vig.; Galbula, Briss.; Capito, Vieill.? Monasa, Vieill.?

Tribe II.—Dentirostres, Cuv.

1ST FAMILY. MUSCICAPIDÆ.—Gen. Platyrhynchus, Desm.; Muscicapa, Auct.; Muscipeta, Cuv.; Onychorhynchus, Fisch.; Vireo, Vieill.? Icteria, Vieill.?

2D FAMILY. LANIADÆ.—1. Sub-fam. *Tyrannina*, Swains. Gen. Tyrannus, Cuv.; Tityra, Vieill. (Psaris, Cuv.); Gubernetes, Such. 2. Sub-fam. *Dicrurina*, Swains. Gen. Artamus, Vieill. (Ocypterus, Cuv.); Dicrurus, Vieill. (Edolus, Cuv.); Trichophorus, Temm.? Irena, Horsf. 3. Sub-fam. *Laniana*, Swains. Gen. Sparactes, Ill.; Lanius, Auct.; Falcunculus, Vieill.; Cyclarhis, Swains.; Lanio, Vieill.? 4. Sub-fam. *Thamnophilina*, Swains. Gen. Vanga, Cuv.; Thamnophilus, Vieill.; Malaconotus, Swains.; Formicivora, Swains.; Drymophila, Swains.; Laniarius, Vieill.; Prionops, Vieill. 5. Sub-fam. *Campephagina*, Swains. Gen. Grauculus, Cuv.; Campephaga, Vieill. (Cebilepyris, Cuv.).3D FAMILY. MERULIDÆ.—1. Sub-fam. *Myotherina*, Swains. Gen. Urotomus, Swains.; Myothera, Ill. (Myrmothera, Vieill.); Pitta, Vieill.; Grallaria, Vieill.; Conophaga, Vieill.; Cinclus, Bechst.? (Hydrobata, Vieill.); Chamæza, Vig. 2. Sub-fam. *Merulina*. Gen. Merula, Ray; Sphecotheres, Vieill.? 3. Sub-fam. *Oriolina*. Gen. Oriolus, Auct. 4. Sub-fam. *Cossyphina*. Gen. Cossypha, Vig.; Timalia, Horsf.? 5. Gen. Petrocincla, Vig.4TH FAMILY. SYLVIADÆ.—1. —? Gen. Hylophilus, Temm.; Iora, Horsf.; Accentor, Bechst.; Prunella, Gessn.? 2. —? Gen. Brachypteryx, Horsf.; Curruca, Bechst.; Ficedula, Bechst.; Œgithina, Vieill.? 3. Sub-fam. *Sylviana*. Gen. Sylvia, Auct.; Melizophilus, Leach; Synallaxis, Vieill.; Malurus, Vieill.; Troglodytes, Cuv.; Regulus, Cuv.; Tyrannulus, Vieill. 4. Sub-fam. *Motacillina*. Gen. Motacilla, Auct.; Budytes, Cuv.; Enicurus, Temm.; Anthus, Bechst.; Corydalla, Vig.; Megalurus, Horsf. 5. Sub-fam. *Saxicolina*. Gen. Saxicola, Bechst. (Eranthe, Vieill.).

5TH FAMILY. PIPRIDÆ.—Gen. Ægithalus, Vig.; Parus, Linn.; Megistina, Vieill.; Pardalotus, Vieill.; Pipra, Linn. (Manacus, Briss.); Rupicola, Briss.; Calyptomena, Raffles; Phibalura, Vieill.; Bombicilla, Briss.; Ampelis, Auct. (Cotinga, Briss.; Tersi, Vieill.); Procnias, Hoffm.; Casmarrhynchus, Temm. (Ampelis, Vieill.); Querula, Vieill.; Coracina, Vieill. (Cephalopterus, Geoff.); Pachycephala, Swains.

Tribe III.—Conirostres, Cuv.

1ST FAMILY. FRINGILLIDÆ.—1. Sub-fam. *Tanagrina*? Gen. Euphonia, Vieill.; Nemosia, Vieill.; Tachyphonus, Vieill.; Saltator, Vieill.; Tanagra, Auct.; Pyrrhula, Vieill.; Ramphopis, Vieill.; Arremon, Vieill.; Dulus, Vieill.? Pipilo, Vieill. 2. Sub-fam. *Alaudina*. Gen. Emberiza, Linn.; Passerina, Vieill.; Alauda, Auct.; Mirafra, Horsf. 3. Sub-fam. *Carduelina*. Gen. Carduelis, Briss.; Ploceus, Cuv. (Agelaii pars, Vieill.). 4. Sub-fam. *Passerina*. Gen. Fringilla, Auct.; Passer, Auct. (Pyrrhula, Cuv.). 5. Sub-fam. *Pyrrhulina*? Gen. Lina-ria, Bechst.; Vidua, Cuv.; Pyrrhula, Briss.?2D FAMILY. STURNIDÆ.—1. Sub-fam. *Icterina*. Gen. Xanthornus, Cuv. (Yphantus, Vieill.); Icterus, Cuv. (Pendulinus, Vieill.); Sycobius, Vieill.? Quiscalus, Vieill.; Cassicus, Daud.; Leistes (Agelaii pars, Vieill.). 2. Sub-fam. *Sturnina*. Gen. Sturnella, Vieill.; Sturnus, Linn.; Amblyramphus, Leach; Dilophus, Vieill.? 3. —? Gen. Lamprotonis, Temm.; Acridotheres, Vieill. (Gracula, Cuv.). 4. —? Gen. Pastor, Temm. (Psaroides, Vieill.); Grallina, Vieill.? 5. —? Gen. Buphaga, Linn.3D FAMILY. CORVIDÆ, Leach.—1. —? Gen. Cracticus, Vieill. (Barita, Cuv.); Nucifraga, Briss. 2. Sub-fam. *Corvina*. Gen. Pica, Briss.; Garrulus, Briss.; Corvus, Auct. 3. Sub-fam. *Coraciina*. Gen. Coracias, Linn. (Galgulus, Briss.); Gracula, Auct. (Eulabes, Cuv.); Ptilonorhynchus, Kuhl.; Glaucopsis, Forst. (Callæas, Lath.); Crypsirina, Vieill. (Phrenotrix, Horsf.). 4. Sub-fam. *Paradisæana*. Astrapia, Vieill.; Parotia, Vieill.; Paradisea, Linn. (Manucodiata, Briss.); Lophorina, Vieill.; Cincinurus, Vieill.; Epimachus, Cuv.? 5. —? Gen. Fregilus, Cuv. (Coracias, Briss.); Pyrrhocorax, Vieill.

4TH FAMILY. BUCERIDÆ, Leach.—Gen. Buceros, Linn. (Hydrocorax, Briss.); Momotus, Briss. (Prionites, Ill.; Baryphonus, Vieill.).

5TH FAMILY. LOXIADÆ.—Gen. Phytotoma, Gmel.; Coccythraustes, Briss.; Pytilus, Cuv.; Loxia, Briss.; Psittirostra, Temm.; Colius, Linn.? Cissops, Vieill. (Bethylus, Cuv.); Strobilophaga, Vieill. (Corythus, Cuv.).

Tribe IV.—Scansores, Auct.

1ST FAMILY. RAMPHASTIDÆ.—Gen. Scythrops, Lath.; Ramphastos, Linn. (Tucana, Briss.); Pteroglossus, Ill.

2D FAMILY. PSITTACIDÆ, Leach.—1. Sub-fam. *Psittacina*. Gen. Psittacus, Auct.; Androglossa. 2. Sub-fam. *Ptyctolophina*. Gen. Ptyctolophus, Vieill.; Calyptorhynchus, Vig. and Hors.; Microglossum, Geoff. 3. Sub-fam. *Macrocerina*. Gen. Macrocerus, Vieill. 4. Sub-fam. *Palæornina*. Gen. Psittacara; Nanodes, Vig. and Hors.; Platycercus; Pezoporos, Ill.; Palæornis, Vig.; Trichoglossus, Vig. and Hors.; Lorius, Vig.; Brotogeris, Vig. 5. Sub-fam. *Psittaculina*. Gen. Psittacula, Kuhl.

3D FAMILY. PICIDÆ.—Gen. Pogonias, Ill.; Bucco, Auct.; Picus, Linn.; Colaptes, Swains.; Yunx, Linn. (Torquilla, Briss.).

4TH FAMILY. CETHIADÆ.—Gen. Dendrocolaptes, Herm. (Dendrocopus, Vieill.); Certhia, Auct.; Climacteris, Temm.; Orthonyx, Temm.; Tichodroma, Ill. (Petrodroma, Vieill.); Upupa, Linn.; Sitta, Linn.; Xenops, Hoffm.; Orthotomus, Horsf.; Neops, Vieill.; Mniotilta, Vieill.; Thriothurus, Vieill.; Pyrrota, Vieill.? Opetiorhynchus, Temm.; Oxyrhynchus, Temm.

5TH FAMILY. CUCULIDÆ, Leach.—Gen. Coccyzus, Vieill.; Leptosomus, Vieill.; Cuculus, Auct.; Indicator, Vieill.; Centropus, Ill. (Corydonyx, Vieill.); Saurothera, Vieill.; Phænicophaus, Vieill.; Crotophaga, Linn.; Trogon, Linn.; Corythaix, Ill.? (Opæthus, Vieill.); Musopha, Isert.?

Tribe V.—Tenuirostres, Cuv.

1ST FAMILY. NECTARINIADÆ?—Gen. Nectarinia, Ill.; (Cæreba, Vieill.); Dacnis, Cuv.; Furnarius, Vieill.?

2D FAMILY. CYNNYRIDÆ.—Gen. Cinnerys, Cuv. (Mellisuga, Vieill.); Dicæum, Cuv.; Drepanis, Temm.

3D FAMILY. TROCHILIDÆ.—Gen. Trochilus, Auct. (Polytmus, Briss.); Mellisuga, Briss. (Orthorhynchus, Lacépède).

4TH FAMILY. PROMEROPIDÆ.—Gen. Promerops, Briss. (Falcinellus, Vieill.).

5TH FAMILY. MELIPHAGIDÆ.—Gen. Meliphaga, Lewin

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System.

Swainson's System. (Philedon, Cuv.; Philemon, Vieill.); Melithreptus, Vieill.; Creadon, Vieill.; Mimetes, King? Sericulus, Swains.? Ptiloris, Swains.; Pomatorhinus, Horsf.? Prinia, Horsf.?

ORDER III.—RASORES, Ill. (Gallinæ, Linn.)

1ST FAMILY. COLUMBIDÆ, Leach.—Gen. Treron, Vieill. (Vinago, Cuv.); Columba, Auct.; Ptilinopus, Swains.; Lophyrus, Vieill.

2D FAMILY. PHASIANIDÆ.—Gen. Meleagris, Linn. (Gallopavo, Briss.); Pavo, Linn.; Dipletron, Vieill. (Polyplectron, Temm.); Gallus, Briss.; Monaulus, Vieill. (Lophophorus, Temm.); Phasianus, Auct.; Argus, Temm.; Numida, Linn. (Melegris, Briss.).

3D FAMILY. TETRAONIDÆ, Leach.—Gen. Liponyx, Vieill. (Cryptonyx, Temm.); Odontophorus, Vieill.; Coturnix, Cuv.; Perdix, Briss.; Ganga, Vieill. (Pterocles, Temm.); Tetrao, Auct.; Lagopus, Vieill.; Syrrhaptes, Ill. (Heteroclitus, Vieill.); Ortygis, Ill. (Ortygodes, Vieill.); Hemipodius, Temm.; Tinamus, Lath. (Crypturus, Ill.; Cryptura, Vieill.).

4TH FAMILY. STRUTHIONIDÆ.—Gen. Rhea, Briss.; Struthio, Linn.; Casarius, Briss.; Dromiceius, Vieill.; Diodus, Linn. (Raphus, Briss.); Otis, Linn.

5TH FAMILY. CRACIDÆ.—Gen. Ourax, Cuv. (Pauxi, Temm.); Crax, Linn.; Penelope, Merr.; Ortalida, Merr.; Opisthocornus, Hoffm.? (Orthocorys, Vieill.); Menura, Lath.; Megapodius, Temm.

ORDER IV.—GRALLATOIRES, Ill. (Grallæ, Linn.)

1ST FAMILY. GRUIDÆ.—Gen. Psophia, Linn.; Anthropoides, Vieill.; Balearica, Briss.; Grus, Pall.; Cariam, Briss. (Dicholophus, Ill.; Zophorhynchus, Vieill.; Macrodactylus, Geoff.).

2D FAMILY. ARDEIDÆ, Leach.—Gen. Aramus, Vieill.; Eurypyga, Ill. (Helias, Vieill.); Ardea, Auct.; Cenchroma, Linn. (Cochlearius, Briss.); Phænicopterus, Linn.; Platalea, Linn. (Platea, Briss.); Ciconia, Briss.; Mycteria, Linn.; Scopus, Briss.; Anastomus, Ill. (Hians, Lacep.); Tantalus, Linn.; Ibis, Lacep. (Falcinellus, Bechst.).

3D FAMILY. SCOLOPACIDÆ.—Gen. Numenius, Briss.; Totanus, Bechst. (Actitis pars., Ill.); Recurvirostra, Linn. (Avocetta, Briss.); Limosa, Briss. (Actitis pars., Ill.); Limicola, Vieill.; Ereunetes, Ill.; Macroramphus, Leach? Scolopax, Auct.; Rusticola, Vieill.; Rynchæa, Cuv. (Rostratula, Vieill.); Machetes, Cuv. (Actitis pars., Ill.); Pelida, Cuv.; Phalaropus, Briss. (Crymophilus, Vieill.); Lobipes, Cuv. (Phalaropus, Vieill.); Tringa, Auct. (Actitis pars., Ill.); Phæopus, Cuv.

THE ORDERS, FAMILIES, AND SUB-FAMILIES OF BIRDS, ACCORDING TO THE SYSTEM OF MR SWAINSON.¹

ORDER I.—RAPTORES. RAPACIOUS BIRDS.

FAMILY VULTURIDÆ. Vultures.

FAMILY FALCONIDÆ. Falcons.—Sub-families: Aquilinae, Eagles; Cymindinae, Kites; Buteoninae, Buzzards; Falconinae, Falcons; Accipitrinae, Hawks.

FAMILY STRIGIDÆ. Owls.

ORDER II.—INSESSORES. PERCHING BIRDS.

Tribe I.—Dentirostres.

FAMILY LANIADÆ. Shrikes.—Sub-families: Lanianæ,

4TH FAMILY. RALLIDÆ, Leach.—Gen. Parra, Linn. Swainson's System. (Jacana, Briss.); Palamedea, Linn. (Anhima, Briss.); Chauna, Ill. (Opistolophus, Vieill.); Glareola, Briss.; Rallus, Auct.; Chionis, Forst.? (Vaginalis, Gmel.); Crex, Bechst. (Ortygometra, Steph.); Gallinula, Briss.; Porphyrio, Briss.; Podoa, Ill. (Heliornis, Vieill.); Fulica, Auct.

5TH FAMILY. CHARADRIADÆ, Leach.—Gen. Hæmatopus, Linn. (Ostralega, Briss.); Calidris, Ill. (Arenaria, Briss.); Falcinellus, Cuv.; Erolia, Vieill.? Cursoria, Lath. (Tachydromus, Ill.); Streptilas, Ill.; Squatarola, Cuv.; Vanellus, Briss. (Tringa, Ill.); Pluvianus, Vieill.; Charadrius, Auct. (Pluvialis, Briss.); Burhinus, Ill.? Himantopus, Briss. (Macrotarsus, Lacep.); Œdicnemus, Cuv.

ORDER V.—NATATOIRES, Ill. (Anseres, Linn.)

1ST FAMILY.—ANATIDÆ, Leach.—1. Sub-fam. *Anserina*. Gen. Anser, Briss.; Bernicla, Steph.; Cheniscus, Brookes's MS.; Chenalopex, Steph.; Plectropterus, Leach. 2. Sub-fam. *Cereopsina*. Gen. Cereopsis, Lath. 3. Sub-fam. *Anatina*. Gen. Tadorna, Leach; Cairina, Flem.; Anas, Auct.; Dafila, Leach; Mareca, Steph.; Querquedula, Ray; Rhynchaspis, Leach. 4. Sub-fam. —? Gen. Clangula, Flem.; Harelda, Ray; Fuligula, Ray; Mergus, Linn. (Merganser, Briss.); Somateria, Leach; Oidemia, Flem.; Biziura, Leach. 4. Sub-fam. *Cygnina*. Gen. Cygnus, Meyer.

2D FAMILY. COLYMBIDÆ, Leach.—Gen. Podiceps, Lath. (Colymbus, Briss. Ill.); Colymbus, Auct. (Mergus, Briss.; Eudytes, Ill.).

3D FAMILY. ALCADÆ.—Gen. Uria, Briss.; Cephus, Cuv.? Mergulus, Ray; Phaleris, Temm. (Alca, Vieill.); Fratercula, Briss. (Mormon, Ill.); Larvæ pars, Vieill.); Alca, Auct. (Larvæ pars, Vieill.); Spheniscus, Briss.; Catarractes, Briss. (Eudytes, Vieill.); Aptenodytes, Forst.

4TH FAMILY. PELECANIDÆ, Leach.—Gen. Onocrotalus, Briss.; Phalacrocorax, Briss. (Carbo, Meyer; Halieus, Ill.; Hydrocorax, Vieill.); Sula, Briss. (Dysporus, Ill.; Morus, Vieill.); Tachypetes, Vieill.; Phaëton, Linn. (Lepturus, Briss.); Plotus, Linn. (Anhinga, Briss.).

5TH FAMILY. LARIDÆ, Leach.—Gen. Sterna, Linn.; Rhynchops, Linn. (Rygchopsalia, Briss.); Larus, Auct.; Stercorarius, Briss. (Lestris, Ill.; Prædatrix, Vieill.); Diomedea, Linn. (Albatrus, Briss.); Haladroma, Ill.; Procellaria, Auct.; Pachyptila, Ill.; Puffinus, Ray; Thalassidroma, Vig.

True Shrikes; Thamnophilinae, Bush Shrikes; Dicrurinae, Drongo Shrikes; Cebilepyrinae, Caterpillar-catchers; Tyranninae, Tyrant Shrikes.

FAMILY MERULIDÆ. Thrushes.—Sub-families: Brachypodinae, Short-footed Thrushes; Myotherinae, Ant Thrushes; Merulinae, True Thrushes; Crateropodinae, Babbler; Oriolinae, Orioles.

FAMILY SYLVIADÆ. Warblers.—Sub-families: Saxicolinae, Stonechats; Philomelinae, Nightingales; Sylvianæ, True Warblers; Parianæ, Tit-mice; Motacillinae, Wag-tails.

FAMILY AMPELIDÆ. Fruit-eaters, or Chatterers.—Sub-

¹ From the *Natural History and Classification of Birds*, vol. ii. p. 205, published in Dr Lardner's *Cabinet Cyclopædia*, vol. xcii. 1837. The accessible form of this recent work renders it less necessary that we should give a full exposition of its systematic portion, and the great amount of its generic groups renders their insertion somewhat incompatible with those prescribed limits which in truth we have already exceeded. But we take it for granted, that every sincere lover of Ornithology will possess himself of Mr Swainson's volumes, to which any abstract we could offer would do injustice.

Birds of Europe. families: Leiotrichanæ, Silky Chatterers? Vireoninæ, Greenlets and Thick-heads; Bombycillinæ, Swallow-chatterers; Ampelinæ, Typical Chatterers; Piprinæ, Manakins.

FAMILY MUSCICAPIDÆ. Fly-catchers.—Sub-families: Querulinæ; Psarianæ, Black-caps; Fluvicolinæ, Water-chats; Muscicapinæ, Fly-catchers; Eurylaiminæ, Broad-bills.

Tribe II.—Coniostres.

FAMILY CORVIDÆ. Crows.—Sub-families: Corvinæ, Typical Crows; Garrulinæ, Jays; Glaucoptinæ, Wattle-crows; Coracinæ, Fruit-crows; Frigilinæ.

FAMILY STURNIDÆ. Starlings.—Sub-families: Sturninæ, Typical Starlings; Lamprotorninæ, Grakles; Scaphidurinæ, Boat-tails; Icterinæ, Hang-nests; Aglainæ, Maizers.

FAMILY FRINGILLIDÆ. Finches.—Sub-families: Coccythraustinae, Hard-bills; Tanagrinae, Tanagers; Fringillinæ, Ground-finches; Alaudinæ, Larks; Pyrrhulinæ, Bullfinches.

FAMILY MUSOPHAGIDÆ. Plantain-eaters.—Sub-families: Phitotominæ, Plant-cutters; Colinæ, Colies; Musophaginæ, Plantain-eaters.

FAMILY BUCERIDÆ. Genus Buceros.

Tribe III.—Scansores.

FAMILY RAMPHASTIDÆ. Toucans.

FAMILY PSITTACIDÆ. Parrots.—Sub-families: Macrocinæ, Maccaws; Psittacinæ, Parrots; Plectolophinæ, Cockatoos; Lorianæ, Lories; Platycircinæ, Loriets.

FAMILY PICIDÆ. Woodpeckers.—Sub-families: Picinæ, True Woodpeckers; Buccoinæ, Barbuts.

FAMILY CETHIADÆ. Creepers.—Sub-families: Certhianæ, True Creepers; Anabatinae, Tree-runners; Sittinæ, Nut-hatchers; Troglodytinæ, Wrens; Buphaginæ, Ox-peckers.

FAMILY CUCULIDÆ. Cuckoos.—Sub-families: Cuculinæ, Parasitic Cuckoos; Coccyzinæ, Hook-billed Cuckoos; Leptostominæ, Long-billed Cuckoos; Indicatorinæ, Honey-guides.

ENUMERATION OF THE BIRDS OF EUROPE.*

ORDER I.—RAPTORES.

Vultur fulvus, Linn.	Griffon Vulture.
V. cinereus, Linn.	Cinereous Vulture.
Neophron percnopterus, Sav.	Egyptian Neophron.
Gypaëtus barbatus, Storr.	Lammer-geyer.
Aquila imperialis, Briss.	Imperial Eagle.
A. chrysæta, Briss.	Golden Eagle.
A. Bonelli.	Bonelli's Eagle.
A. nævia, Meyer.	Spotted Eagle.
A. pennata, Steph.	Booted Eagle.
Haliaëtus albicilla, Selby.	Sea-Eagle.
H. leucocephalus, Sav.	White-headed Eagle.
Pandion haliaëtus, Sav.	Osprey.
Circæus brachydactylus, Vieill.	Short-toed Eagle.

Buteo vulgaris, Bechst.	Common Buzzard.
B. lagopus, Flem.	Rough-legged Buzzard.
Pernis apivorus, Cuv.	Honey Buzzard.
Astur palumbarius, Bechst.	Goshawk.
Falco islandicus, Lath.	Jer-Falcon.
F. lanarius, Linn.	Lanner Falcon.
Falco peregrinus, Linn.	Peregrine Falcon.
F. subbuteo, Linn.	Hobby.
F. rufipes, Bechst.	Red-footed Falcon.
F. æsalon, Temm.	Merlin.
F. concolor, Temm.	Lead-coloured Falcon.
F. tinnunculus, Linn.	Kestrel.
F. tinnunculoides, Natt.	Lesser Kestrel.
Milvus vulgaris, Flem.	Kite.
M. ater.	Black Kite.
Nauclerus furcatus, Vig.	Swallow-tailed Kite.
Elanus melanopterus, Leach.	Black-tailed Kite.

* This and the preceding family are placed as sub-families in Mr Swainson's synopsis,—we presume, by an oversight in typographical correction. A similar inadvertency occurs among the tenuirostral tribe.

* From Mr Gould's *Birds of Europe*, recently completed in five volumes royal folio, 1837. According to the author of this sumptuous work, the number of European birds may now be stated to amount to 462 species, of which 310 may be regarded as British. Of the latter, about 170 are permanent residents in our island, eighty-five are summer birds of passage, which visit us from the south, and forty-five are winter birds of passage, which visit us from the north. This seems to leave ten species unaccounted for: these may probably be regarded as accidental stragglers. We may add, that Mr Doubleday, in his *Nomenclature of British Birds* (1836), states the total number of species actually killed or captured in Britain as amounting to 323, of which the *Raptores* are thirty, the *Insectores* 117, the *Rasores* seventeen, the *Grallatores* sixty-six, and the *Natatores* ninety-three.

Tribe IV.—Tenuirostres. Suctorial Birds.

FAMILY MELIPHAGIDÆ. Honey-suckers.
FAMILY CINNYRIDÆ. Sun-birds.
FAMILY TROCHILIDÆ. Humming birds.
FAMILY PROMEROPIDÆ. Hoopoes.
FAMILY PARADISIADÆ. Paradise Birds.

Tribe V.—Fissirostres. Fissirostral Birds.

FAMILY MEROPIDÆ. Bee-eaters.
FAMILY HALCYONIDÆ. King-fishers.
FAMILY TROGONIDÆ. Trogons.
FAMILY CAPRIMULGIDÆ. Night-jars.
FAMILY HIRUNDINIDÆ. Swallows.

ORDER III.—RASORES. RASORIAL BIRDS.

FAMILY PAVONIDÆ. Peacocks and Pheasants.
FAMILY TETRAONIDÆ. Partridges and Grouse.
FAMILY STRUTHIONIDÆ. Ostriches.
FAMILY COLUMBIDÆ. Pigeons.—Sub-family: Columbinæ.
FAMILY MEGAPODIADÆ. Great-foots.

ORDER IV.—GRALLATORES. WADERS.

FAMILY ARDEADÆ. Herons and Cranes.
FAMILY TANTALIDÆ. Ibis.
FAMILY RALLIDÆ. Rails.
FAMILY SCOLOPACIDÆ. Sand-pipers and Snipes.
FAMILY CHARADRIADÆ. Plovers.

ORDER V.—NATATORES. SWIMMERS.

FAMILY ANATIDÆ. Ducks.—Sub-families: Phænicop-tinæ, Flamingoes; Anserinæ, Geese and Swans; Anatinæ, River-ducks; Fuligininæ, Sea-ducks; Merganinæ, Mergansers.
FAMILY COLYMBIDÆ. Grebes and Divers.
FAMILY ALCADE. Auks.
FAMILY PELECANIDÆ. Pelicans.
FAMILY LARIDÆ.¹ Gulls.

Birds of Europe.

Circus rufus, Briss.
C. cyaneus, Meyer.
C. pallidus, Sykes.
C. cineraceus, Meyer.
Strix flammea, Linn.
Bubo maximus, Sibb.
B. ascalaphus, Sav.
Otus vulgaris, Flem.
O. brachyotus, Cuv.
Scops Aldrovandi, Will. and Ray.
Surnia cinerea.
S. nyctea, Dum.
S. Uralensis, Dum.
S. funerea, Dum.
Ulula nebulosa, Cuv.
Syrnium aluco, Sav.
Noctua nudipes, Wils.
N. ? tengmalmi, Selby.
N. passerina.

Marsh Harrier.
 Hen Harrier.
 Pallid Harrier.
 Ash-coloured Harrier.
 Barn Owl.
 Great-horned or Eagle Owl.
 Eastern Great-horned Owl.
 Long-eared Owl.
 Short-eared Owl.
 Scops-eared Owl.
 Great Cinereous Owl.
 Snowy Owl.
 Ural Owl.
 Hawk Owl.
 Barred Owl.
 Tawny or Wood Owl.
 Little Owl.
 Tengmalm's Owl.
 Sparrow Owl.

Saxicola rubetra, Bechst.
S. rubicola, Bechst.
Phoenicurus rutilica, Swains.
Ph. tithys, Jard. and Selb.
Ph. suecica, Jard. and Selb.
Erythaca rubecula, Swains.
Accentor alpinus, Bechst.
A. modularis, Cuv.
A. montanellus, Temm.
Locustella fluviatilis.
L. avicula, Ray.
L. luscinioides.
L. certhiola.
Salicaria turdoides, Selb.
S. olivetorum, Strickl.
S. arundinacea, Selb.
S. palustris.
S. phragmitis, Selb.
S. melanopogon.
S. aquatica.
S. galactotes.
S. cisticola.
S. ? Cetti.
S. ? sericea.
Philomela luscini, Swains.
Ph. turdoides, Blyth.
Calliope Lathamii.
Curruc Orphea.
C. atricapilla, Bechst.
C. hortensis, Bechst.
C. Rupellii.
C. melanocephala, Lath.
C. leucopogon.
C. cinerea, Bechst.
C. garrula, Bechst.
C. conspicillata.
C. sarda.
C. nisoria.

Whinchat.
 Stonechat.
 Redstart.
 Black Redstart.
 Blue-throated Warbler.
 Robin.
 Alpine Accentor.
 Hedge Accentor.
 Mountain Accentor.
 Reed Locustelle.
 Brake Locustelle.
 Willow Locustelle.
 Creeping Locustelle.
 Great Sedge Warbler.
 Olive-tree Salicaria.
 Reed Wren.
 Marsh Warbler.
 Sedge Warbler.
 Moustached Warbler.
 Aquatic Warbler.
 Rufous Sedge Warbler.
 Fan-tail Warbler.
 Cetti's Warbler.
 Silky Warbler.
 Nightingale.
 Thrush Nightingale.
 Gorget Warbler.
 Orpheus Warbler.
 Black-cap.
 Garden Warbler.
 Ruppell's Warbler.
 Sardinian Warbler.
 Sub-alpine Warbler.
 Common White-throat.
 Lesser White-throat.
 Spectacle Warbler.
 Marmora's Warbler.
 Barred Warbler.

ORDER II.—INSESSORES.¹

Caprimulgus Europæus, Linn. } European Goat-sucker.
C. ruficollis. } Red-collared Goat-sucker.
Cypselus murarius, Temm. } Swift.
C. alpinus, Temm. } White-bellied Swift.
Hirundo rustica, Linn. } Chimney Swallow.
H. rufula, Temm. } Rufous Swallow.
H. rupestris, Linn. } Rock-Martin.
H. urbica, Linn. } Martin.
H. riparia, Linn. } Sand-Martin.
Merops apiaster, Linn. } Bee-eater.
Coracias garrulus, Linn. } Roller.
Alcedo isipda, Linn. } Kingfisher.
A. rudis, Linn. } Black and White Kingfisher.
Muscicapa luctuosa, Temm. } Pied Fly-catcher.
M. albigollis, Temm. } White-collared Fly-catcher.
M. parva, Bechst. } Red-breasted Fly-catcher.
M. grisola, Linn. } Spotted Fly-catcher.
Collurio excubitor, Vig. } Great Shrike.
C. meridionalis, Vig. } Great Gray Shrike.
C. minor, Vig. } Lesser Gray Shrike.
Lanius collurio, Linn. } Red-backed Shrike.
L. rufus, Briss. } Wood-Chat.
Oriolus galbula, Linn. } Golden Oriole.
Merula vulgaris, Ray. } Black Ouzel or Blackbird.
M. torquata, Briss. } Ring-Ouzel.
M. migratoria, Swains. } Migratory Ouzel.
Turdus atrogularis, Temm. } Black-throated Thrush.
T. pilaris, Linn. } Fieldfare.
T. viscivorus, Linn. } Missel-Thrush.
T. musicus, Linn. } Song-Thrush.
T. iliacus, Linn. } Redwing.
T. Naumannii, Temm. } Naumann's Thrush.
T. pallidus, Pall. } Pallid Thrush.
T. Whitei, Eyton. } White's Thrush.
T. Sibericus, Pall. } Siberian Thrush.
Cinclus aquaticus, Bechst. } Water-Ouzel.
C. melanogaster, Brehm. } Black-bellied Water-Ouzel.
C. Pallasii, Temm. } Pallas's Water-Ouzel.
Petrocincla saxatilis, Vig. } Rock-Thrush.
P. cyanea, Vig. } Blue Thrush.
Saxicola cachinnans, Temm. } Black Wheat-ear.
S. leucomela, Temm. } Pied Wheat-ear.
S. œnanthe, Bechst. } Wheat-ear.
S. stapazina, Temm. } Russet Wheat-ear.
S. aurita, Temm. } Black-eared Wheat-ear.

Melizophilus provincialis, Leach. } Dartford Warbler.
Troglodytes Europæus, Cuv. } Wren.
Sylvia trochilus, Gmel. } Willow Wren.
S. rufa, Lath. } Chiff-Chaff.
S. sibilatrix, Bechst. } Wood Wren.
S. icterina, Vieill. } Yellow Willow Wren.
S. hippolais, Temm. } Melodious Willow Wren.
S. Nattereri, Temm. } Natterer's Warbler.
Anthus Richardi, Vieill. } Richard's Pipit.
A. pratensis, Bechst. } Meadow Pipit.
A. rufescens, Temm. } Tawny Pipit.
A. aquaticus, Bechst. } Rock or Shore Pipit.
A. arboreus, Bechst. } Tree Pipit.
A. rufogularis, Temm. } Red-throated Pipit.
Motacilla Yarrellii. } Pied Wagtail.
M. lugubris, Pall. } White-winged Wagtail.
M. alba, Linn. } White Wagtail.
M. neglecta, Gould. } Gray-headed Wagtail.
M. boarula, Lath. } Gray Wagtail.
Regulus ignicapillus, Cuv. } Fire-crested Wren.
R. vulgaris, Cuv. } Golden-crested Wren.
R. modestus. } Dalmatian Regulus.
Parus major, Linn. } Great Tit.
P. lugubris, Natt. } Sombre Tit.
P. Sibericus, Gmel. } Siberian Tit.
P. bicolor, Linn. } Toupet Tit.

¹ Including the SCANSORES of the preceding Treatise.

Birds of
Europe.

Ardea purpurea, Linn. Purple Heron.
A. *comata*, Pall. Squacco Heron.
A. *alba*, Linn. Great Egret.
A. *garzetta*, Linn. Little Egret.
A. *rustata*, Wagl. Rufous-backed Egret.
Nycticorax europæus, Steph. Common Night-Heron.
Botaurus stellaris, Steph. Common Bittern.
B. *lentiginosus*, Steph. Freckled Bittern.
B. *minutus*, Selby. Little Bittern.
Ciconia alba, Bellon. White Stork.
C. *nigra*, Bellon. Black Stork.
C. *Maquari*, Temm. Maquari Stork.
Platalea leucorodia, Linn. Spoonbill.
Phœnicopterus ruber, Linn. Common Flamingo.
Oedicnemus crepitans, Temm. Thick-kneed Bustard.
Himantopus melanopterus, Meyer. } Long-legged Plover.
Squatarola cinerea, Cuv. } Gray Plover.
Vanellus cristatus, Meyer. } Lapwing.
V. *Keptuschka*, Temm. Keptuschka Lapwing.
Pluvianus spinosus. } Spur-winged Plover.
Charadrius pluvialis, Linn. Golden Plover.
C. *morinellus*, Linn. Dotterel.
C. *hiaticula*, Linn. Ring-Dotterel.
C. *minor*, Meyer. Little Ring-Dotterel.
C. *Cantianus*, Linn. Kentish Plover.
C. *pyrrhorostrax*, Temm. } Red-chested Dotterel.
Hæmatopus ostralegus, Linn. Oyster-Catcher.
Ibis falcinellus, Temm. Glossy Ibis.
Numenius arquata, Lath. Common Curlew.
N. *Phæopus*, Lath. Whimbrel.
N. *tenuirostris*, Sav. Slender-billed Curlew.
Limosa melanura, Leisl. Black-tailed Godwit.
L. *rufa*, Briss. Bar-tailed Godwit.
L. *terek*, Temm. Terek Godwit.
Recurvirostra Avocetta, Linn. Avocet.
Totanus fuscus, Leisl. Spotted Redshank.
T. *calidris*, Bechst. Redshank.
T. *semipalmatus*, Temm. } Semipalmated Sandpiper.
T. *glottis*, Bechst. Greenshank.
T. *Bartramius*, Temm. Bartram's Sandpiper.
T. *stagnatilis*, Bechst. Marsh Sandpiper.
T. *ochropus*, Temm. Green Sandpiper.
T. *glareola*, Temm. Wood Sandpiper.
T. *hypoleucus*, Temm. Common Sandpiper.
T. *macularius*, Temm. Spotted Sandpiper.
Streptilas collaris, Temm. Turnstone.
Scolopax rusticola, Linn. Woodcock.
S. *major*, Linn. Great Snipe.
S. *Sabini*, Vig. Sabine's Snipe.
S. *gallinago*, Linn. Common Snipe.
S. *gallinula*, Linn. Jack Snipe.
Macroramphus griseus, Leach. } Gray Snipe.
Calidris canutus, Briss. } Knot.
and Cuv. }
Machetes pugnax, Cuv. Ruff.
Tringa rufescens, Vieill. Buff-breasted Sandpiper.
T. *pectoralis*, Bonap. Pectoral Sandpiper.
T. *subarquata*, Temm. Pygmy Curlew.
T. *variabilis*, Meyer. Dunlin or Purre.
T. *Schinzii*, Bonap. Schinz's Sandpiper.
T. *platyrhyncha*, Temm. Broad-billed Tringa.
T. *minuta*, Leisl. Little Sandpiper.
T. *Temminckii*, Leisl. Temminck's Tringa.
T. *maritima*, Brunn. Purple Sandpiper.
Arenaria calidris, Meyer. Sanderling.
Phalaropus hyperboreus, Lath. } Red-necked Phalarope.

Phalaropus platyrhynchus, Temm. } Gray Phalarope.
Fulica atra, Linn. Coot.
Rallus aquaticus, Linn. Water-Rail.
Porphyrio hyacinthinus, Temm. Hyacinthine Porphyrio.
Gallinula crex, Lath. Land-Rail.
G. *chloropus*, Lath. Common Gallinule.
Zapornia porzana. Spotted Crake.
Z. *Baillonii*, Leach. Baillon's Crake.
Z. *pusilla*, Steph. Little Crake.

ORDER V.—NATATORES.

Anser hyperboreus, Pall. Snow-Goose.
A. *ferus*, Steph. Gray-Lag Wild Goose.
A. *segetum*, Steph. Bean Goose.
A. *albifrons*, Steph. White-fronted Goose.
A. *leucopsis*, Bechst. Bernicle Goose.
A. *ruficollis*, Pall. Red-breasted Goose.
A. *brenta*, Flem. Brent Goose.
Chenalopex Ægyptiaca, Steph. } Egyptian Goose.
Cygnus mansuetus, Gmel. Domestic Swan.
C. *ferus*, Ray. Whistling Swan or Hooper.
C. *Bewickii*, Yarr. Bewick's Swan.
Tadorna vulpanser, Flem. Common Shieldrake.
T. *rutula*, Steph. Ruddy Shieldrake.
Mareca Penelope, Selby. Wigeon.
Rhynchaspis clypeata, Steph. Shoveller Duck.
Anas Boschas, Linn. Common Wild Duck.
Querquedula Crecca, Steph. Common Teal.
Q. *glocitans*, Vig. Bimaculated Teal.
Q. *circia*, Steph. Gargany Teal.
Dafila caudacuta, Leach. Pin-tail Duck.
Chauliodes strepera, Swains. Gadwall.
Fuligula ferina, Steph. Red-headed Pochard.
F. *leucophthalma*, Steph. } White-eyed or Castaneous Duck.
F. *rufina*, Steph. Red-crested Duck.
F. *cristata*, Steph. Tufted Duck.
F. *marila*, Steph. Scaup Pochard.
F. *dispar*, Steph. Western Duck.
F. *marmorata*. Marbled Duck.
Somateria mollissima, Leach. Eider Duck.
S. *spectabilis*, Leach. King Duck.
Oidemia perspicillata, Flem. Surf Scoter.
O. *fusca*, Flem. Velvet Scoter.
O. *nigra*, Flem. Black Scoter.
Clangula vulgaris, Leach. Golden Eye.
C. *Barrovii*, Sw. and Rich. } Barrow's Duck.
C. *histrionica*, Leach. Harlequin Duck.
Harelda glacialis, Leach. Long-tailed Duck.
Undina leucocephala. White-headed Duck.
Mergus merganser, Linn. Goosander.
M. *serrator*, Linn. Red-breasted Merganser.
M. *cucullatus*, Linn. Hooded Merganser.
M. *albellus*, Linn. Smew.
Podiceps cristatus, Lath. Great crested Grebe.
P. *rubricollis*, Lath. Red-necked Grebe.
P. *cornutus*, Lath. Horned Grebe.
P. *auritus*, Lath. Eared Grebe.
P. *minor*, Lath. Little Grebe, or Dabchick.
Colymbus glacialis, Linn. Northern Diver.
C. *arcticus*, Linn. Black-throated Diver.
C. *septentrionalis*, Linn. } Red-throated Diver.
Uria troile, Linn. Foolish Guillemot.
U. *lachrymans*, Lapy. Bridled Guillemot.
U. *Brunnichii*, Sab. Brunnick's Guillemot.
U. *grylle*, Lath. Black Guillemot.
Alca impennis, Linn. Great Auk.

Birds of
Europe.

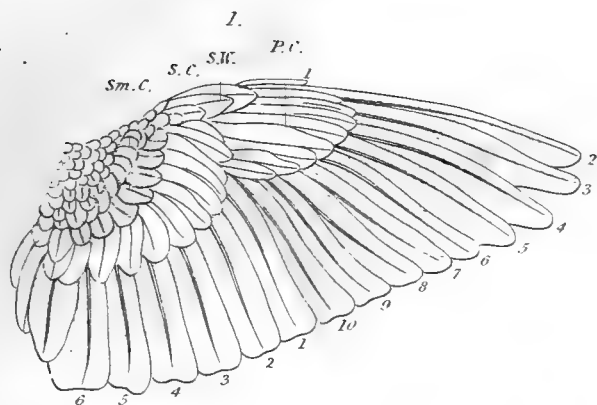
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Alca torda, Linn.	Razor-billed Auk.	Xema ridibunda, Boié.	Laughing Gull.		
Mergulus alle, Bon.	Little Auk.	X. atricilla.	Black-winged Gull.		
Mormon fratercula, Temm.	Puffin.	X. melanocephala, Boié.	Black-headed Gull.		
M. glacialis, Leach.	Northern Puffin.	X. minuta, Boié.	Little Gull.		
Pelecanus onocrotalus, Linn.	Pelican.	X. Sabinii, Leach.	Sabine's Gull.		
P. crispus, Feld.	Dalmatian Pelican.	Larus marinus, Linn.	Great black-backed Gull.		
Phalacrocorax carbo, Steph.	Common Cormorant.	L. fuscus, Linn.	Lesser black-backed Gull.		
Ph. graculus, Briss.	Black Cormorant.	L. glaucus, Brunn.	Glaucous Gull.		
Ph. pygæmus, Steph.	Little Cormorant.	L. islandicus, Edm.	Iceland Gull.		
Ph. cristatus, Steph. and Flem.	Green Cormorant.	L. argentatus, Brunn.	Herring Gull.		
Ph. Desmarestii.	Desmarest's Cormorant.	L. rissa, Linn.	Kittiwake Gull.		
Sula Bassana, Briss.	Solan Goose.	L. eburneus, Gmel.	Ivory Gull.		
S. melanura, Temm.	Black-tailed Gannet.	L. canus, Linn.	Common Gull.		
Sterna Caspia, Pall.	Caspian Tern.	L. Audouinii, Temm.	Audouin's Gull.		
S. cantiaica, Gmel.	Sandwich Tern.	Lestris catarractes, Temm.	Skua.		
S. Anglica, Mont.	Gull-billed Tern.	L. pomarinus, Temm.	Pomarine Gull.		
S. hirundo, Linn.	Common Tern.	L. Richardsonii, Swains.	Richardson's Lestris.		
S. Dougallii, Mont.	Roseate Tern.	L. parasiticus, Ill.	Parasitic Gull.		
S. minuta, Linn.	Little Tern.	Puffinus Anglorum, Ray.	Manks Shearwater.		
S. stolidus.	Noddy Tern.	P. obscurus.	Dusky Shearwater.		
Viralva nigra, Leach.	Black Tern.	P. cinereus, Steph.	Cinereous Shearwater.		
V. leucoptera, Leach.	White-winged Tern.	Procellaria glacialis, Linn.	Fulmar Petrel.		
V. leucopareia, Steph.	Moustache Tern.	Thalassidroma Leachii.	Fork-tailed Petrel.		
		Th. pelagica, Selby.	Common Storm-Petrel.		
		Th. ? Bulwerii.	Bulwer's Petrel.		

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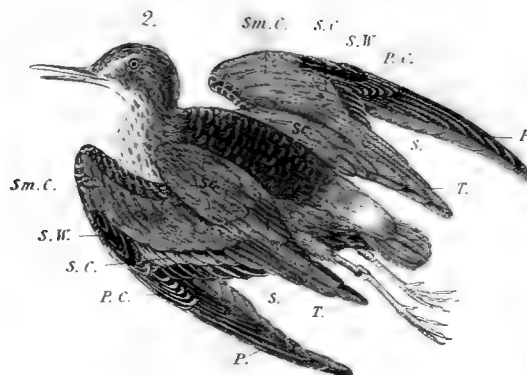
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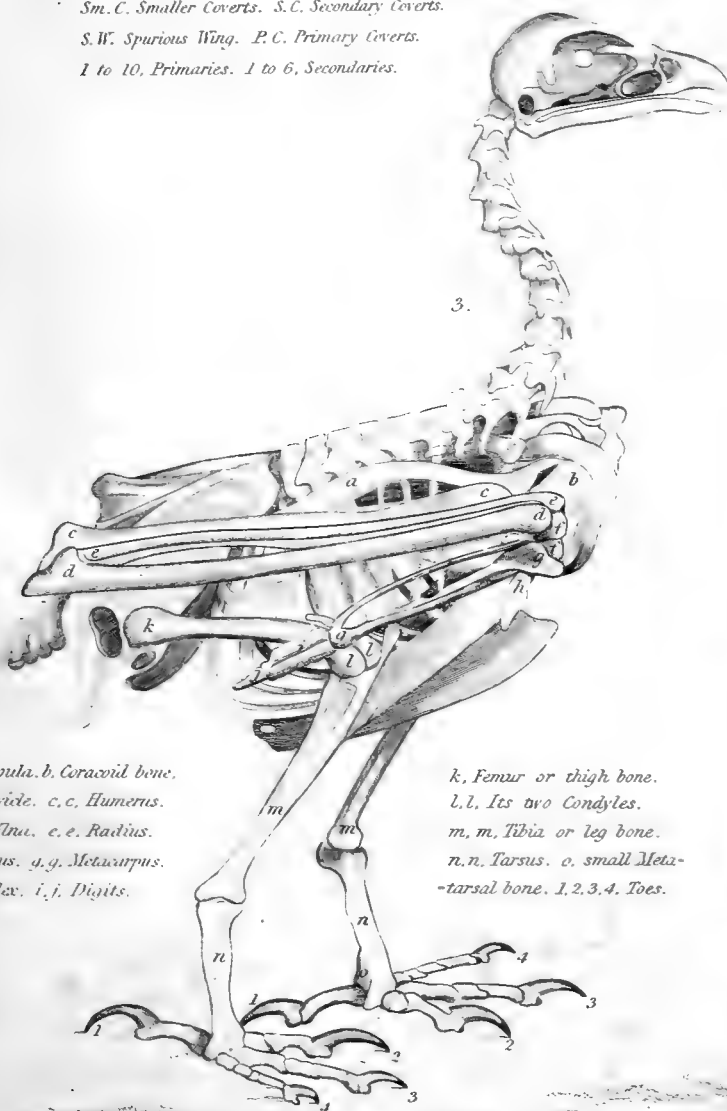


Wing of Starling—*Sturnus vulgaris*.

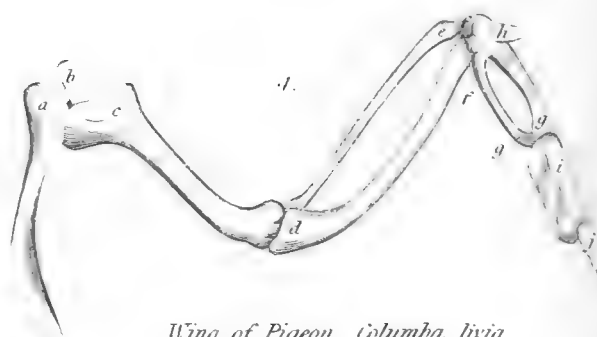
Sm. C. Smaller Coverts. S. C. Secondary Coverts.
S. W. Spurious Wing. P. C. Primary Coverts.
1 to 10, Primaries. 1 to 6, Secondaries.



Sr. Scapulars. Sm. C. Smaller Coverts.
S. W. Spurious Wing. S. C. Secondary Coverts.
P. C. Primary Coverts. P. Primaries.
S. Secondaries. T. Tertials.



Skeleton of Golden Eagle—*Aquila chrysaetos*.



Wing of Pigeon—*Columba livia*.

a, Scapula. b, tip of Coracoid bone. c, Humerus. d, Ulna.
e, Radius. f, f, Carpus. g, g, Metacarpus. h, h, Pollex. i, j, Digits.



Wing of Pigeon—*Columba livia*.

S. W. Spurious Wing.
S. S. Secondaries.
P. P. Primaries.



1.



Cathartes aura.



3.

Vultur cinereus.



4.



5.

Gypaetus barbatus.



6.

Sarcoramphus papa.

Neophron percnopterus.



7.



8.

Haliaeetus albirostris.

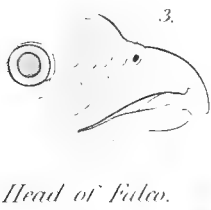


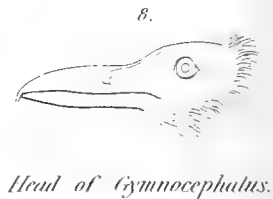
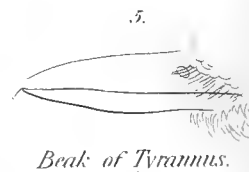
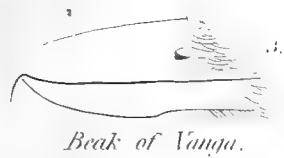
9.

Caracara Braziliensis.

Morphnus cristatus.

Harpyia destructor.





1.



Myiothera superciliosa.

2.



Ramphocelus Jucaya.

3.



Eulabes Javanus.

4.



Menura Irya.

5.



Pipra parvula.

6. a.



Toe of Caprimulgus.

6.



Podargus Cuvieri.

7.



Calyptomena viridis.

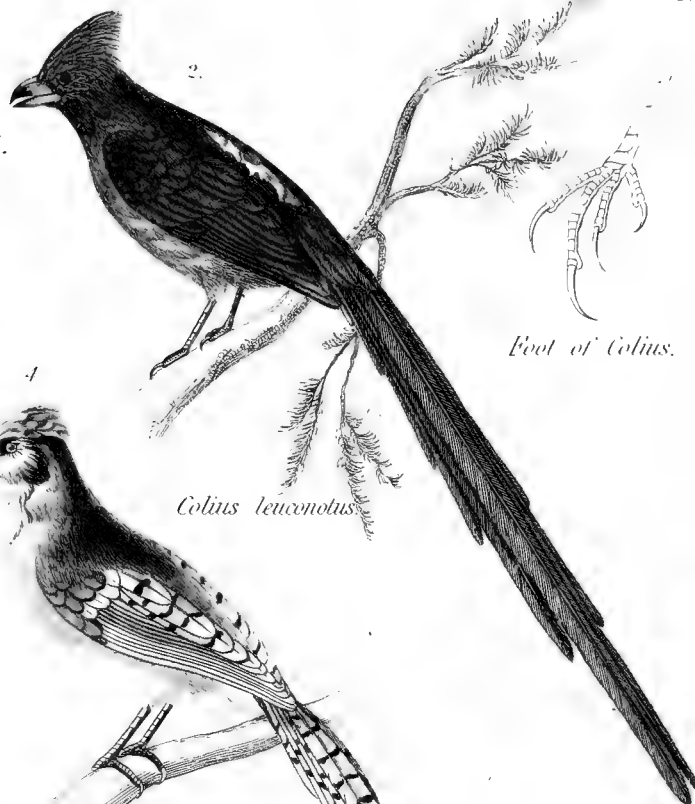
8.



Corydon Temminckii.



Alda cristata.



Foot of Colius.



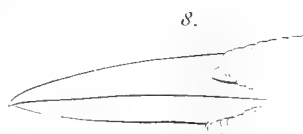
Colius leucocollis.



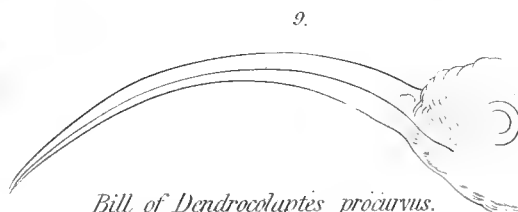
Cassicus cristatus.



Synallaxis Tupinieri.



Bill of Parulisea.



Bill of Dendrocolaptes procerus.



Parulisea apoda.



Ornismya superba.



Melithreptus vestarius.



Upupa epops.



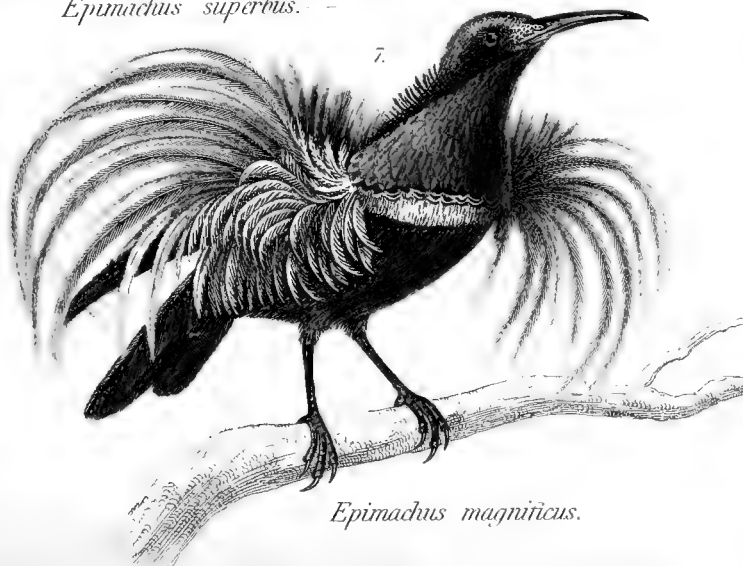
Epimachus superbus.



Promerops currieri.



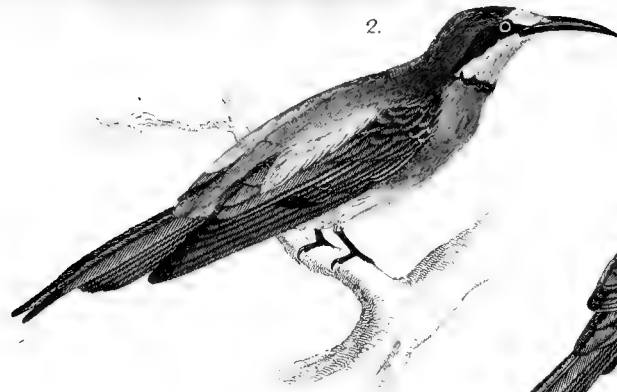
Trochilus pella.



Epimachus magnificus.



Foot of *Alcedo*.



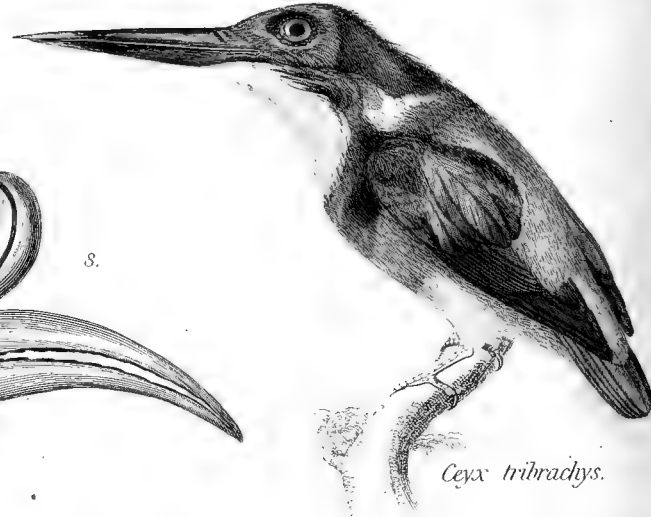
Merops apiaster.



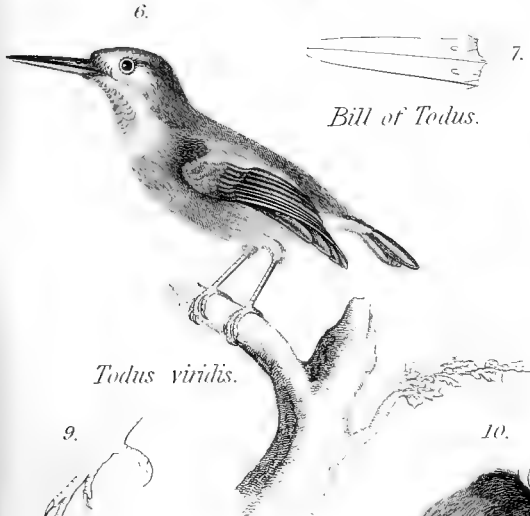
Prionites momota.



Alcedo cristata.



Ceyx tribrachys.



Todus viridis.



Bill of *Todus*.



Buceros rhinoceros.



Buceros hydrocorax.



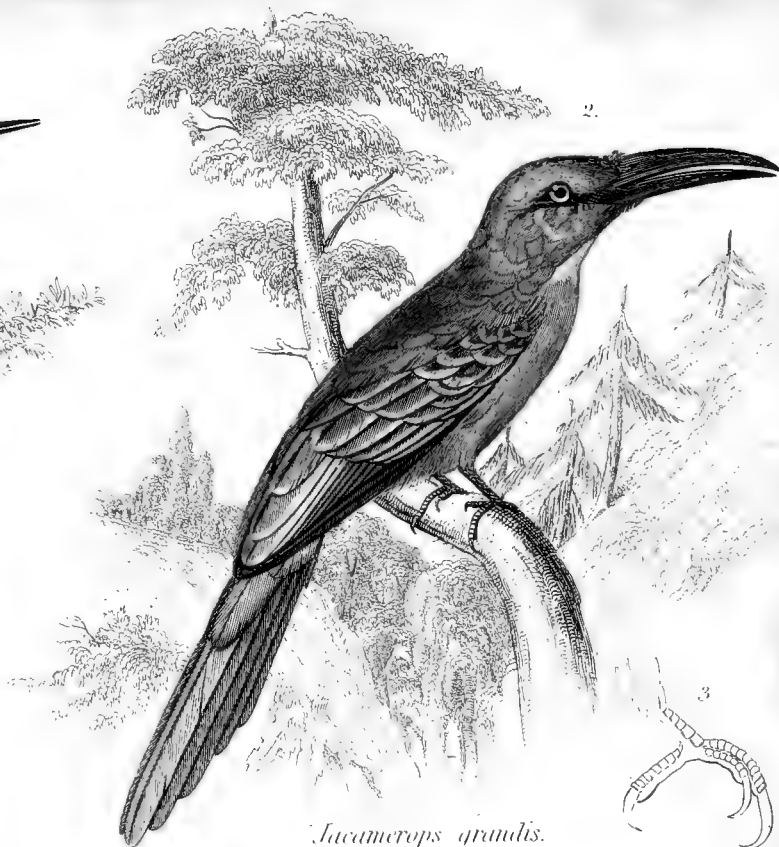
Foot of *Ceyx*.



Foot of *Todus*.



Galbula ruficauda.



Tucamerops grandis.



Foot of Picoides.



Coccyzus cristatus.



Bill of Leptosomus.



Indicator minor.



Monasa leucops.



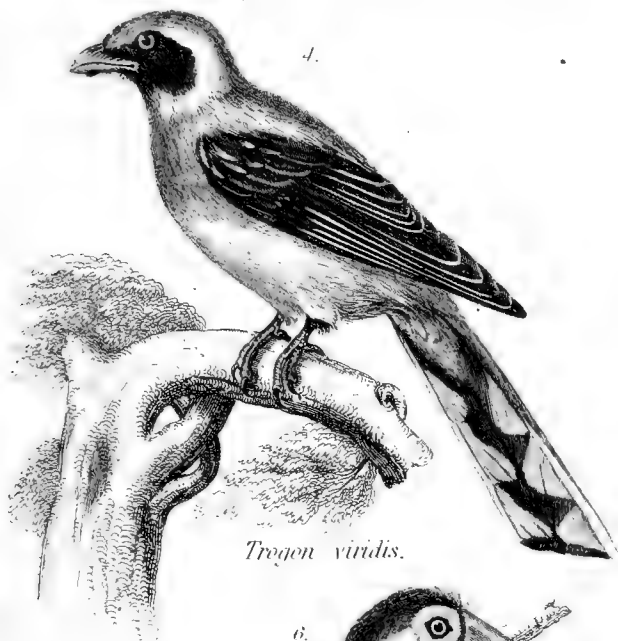
Phenicoplurus superciliosus.



Pogonias major.



Scythrops Novae Hollandiae.



Trogon viridis.



Crotophaga ani.



Ramphastos toco.



Pteroglossus auranti.



Macawanus tricolor.



*Calyptorhynchus
Banksii.*



Phytolophus galeritus.



Pezophorus terrestris.



Head of Microglossum.



Microglossum aterimum.



Corythix Paulina.



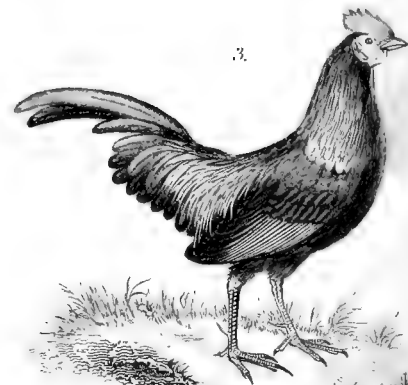
Alusophaga gigantea.



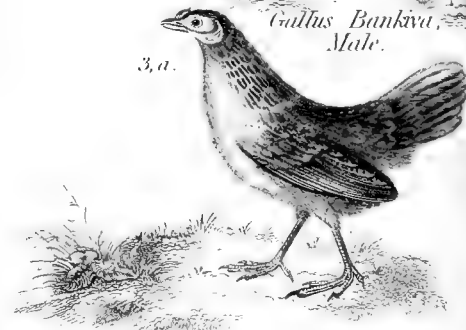
Craux rubra.



Head of Omeis pauxi.



Gallus Bankiva, Male.



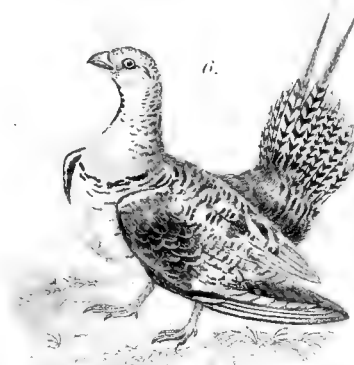
Gallus Bankiva, Female.



Tragopan Satyrus.



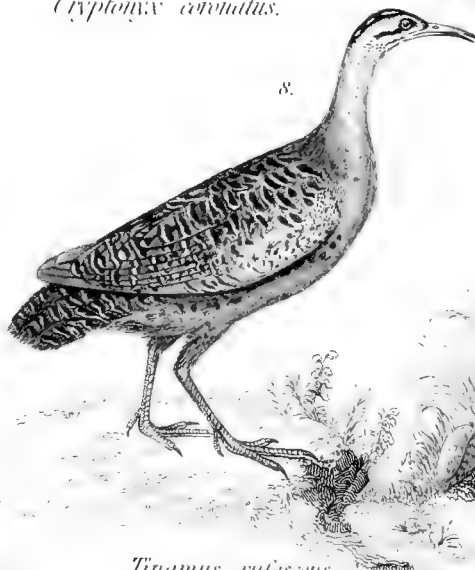
Cryptonyx coronatus.



Pterocles arenarius.



Oryx Californica.



Tinamus rufescens.



Oryzopsis pugnax.

1.



Lophyrus coronatus.

2.



Casuarus galeatus.

3.



Vinago aromaticus.

5.



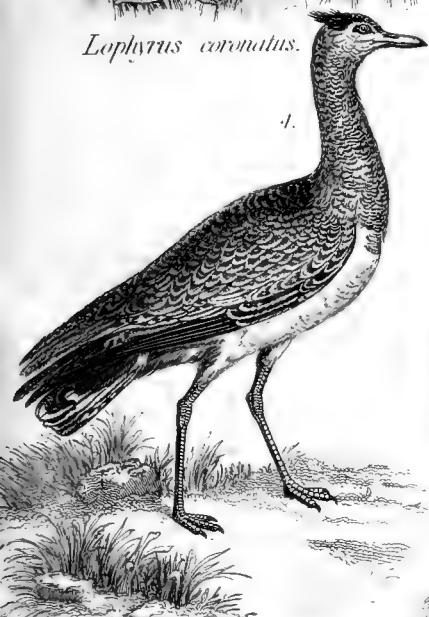
Struthio camelus.

6.



Feathers of the Emu.

4.



Otis Arabs.

7.



Microdactylus cristatus.

9.



Anthropoides pavonina.



Grus Americana.



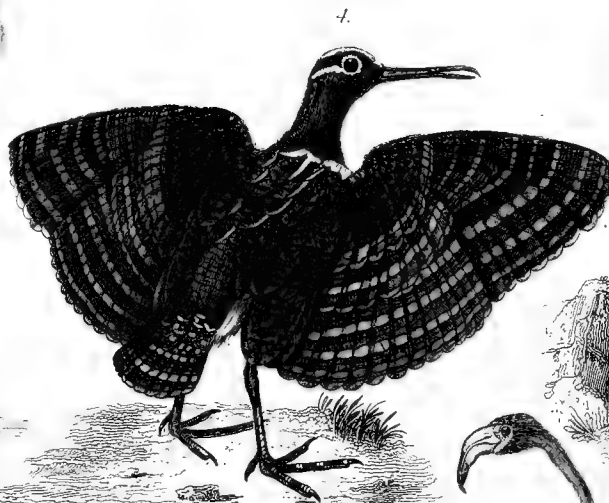
Platalea ajaja.



Numenius longirostris.



Machetes pugnax.



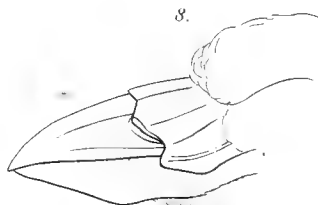
Rhynchaea capensis.



Recurvirostra Americana.



Chionis vaginalis.

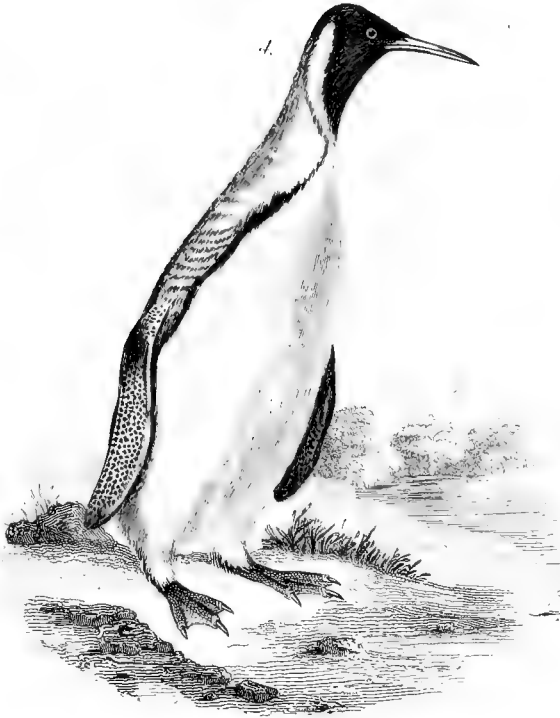


1.



Podiceps cornutus.

4.



Aptenodytes patagonicus.

2.



Podiceps surinamensis.

6.



Bill of Puffinus.

9.



Bill of Puffinus.

3. a.



Gen. Spheniscus.

3. b.



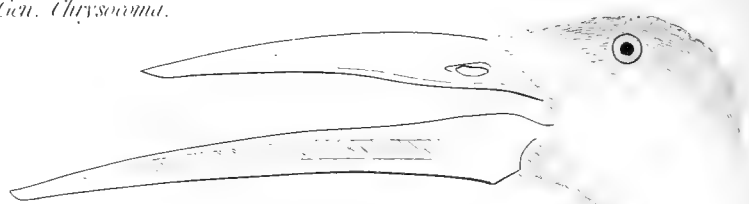
Gen. Chrysocoma.

5.



Procellaria pelagica.

7.



Rhynchops nigra.

8.



Larus marinus.

10.



Pelecanus onocrotalus.

1.



Platus melanogaster

2.



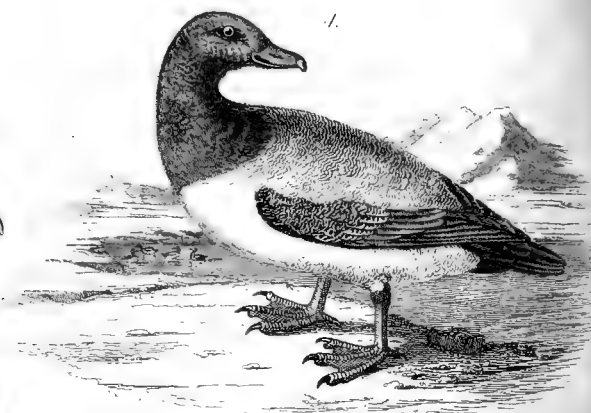
Cercopsis Novæ Hollandiæ.

3.



Clangula austriaca.

4.



Fuligula Valisneri.

6.



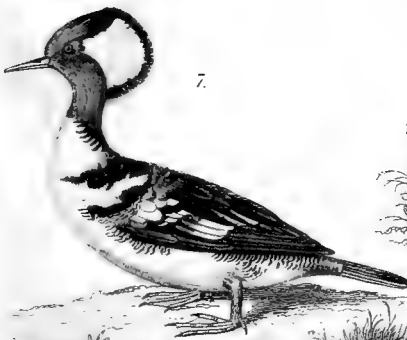
Bill of Merquis.

5.



Cygnus albus.

7.



Merquis cucullatus.

8.

